PB90-153750

Superfund Record of Decision (EPA Region 1)
Norwood PCB's, Norwood, MA
(First Remedcial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

29 Sep 89

**U.S. Department of Commerce**
**National Technical Information Service**
**NTIS**

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United States
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Agency

Office of
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Remedial Response

EPA/ROD/R01-89/043
September 1989

EPA

# Superfund Record of Decision:

## Norwood PCBs, MA

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U.S. DEPARTMENT OF COMMERCE
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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 26-acre Norwood PCBs site consists of several industrial and commercial properties, parking areas, and vacant lots in Norwood, Norfolk County, Massachusetts. Significant site features include the Grant Gear property to the north, an office park complex which extends along the western portion of the site, and residential areas which border the site to the west and north. Meadow Brook, which discharges to the Neponset River, and an associated wooded wetlands area make up the north site boundary. Four piles of sediment sludge, previously dredged from the stream, are located on the south bank of the brook. Site contamination originated from disposal practices of previous businesses, primarily electrical equipment manufacturing, that operated from the building now owned by Grant Gear Realty Trust. In April 1983 the State responded to a citizen report of previous industrial waste dumping at the site and took surficial soil and sediment samples which confirmed PCB contamination. In June 1983 EPA removed 500 tons of PCB- contaminated soil from the office park complex and Grant Gear properties and disposed of it offsite. The State implemented an Interim Remedial Measure in 1986 to limit access to areas with high surface contamination on the Grant Gear property by constructing a 1.5-acre cap. The primary contaminants of concern affecting soil, sediment, ground water, and building surfaces are VOCs including TCE and PCE; other organics including PCBs, PAHs, and phenols; and metals.
(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision - Norwood PCBs, MA
First Remedial Action - Final
Contaminated Media: soil, sediment, gw
Key Contaminants: VOCs (PCE, TCE), other organics (PAHs, PCBs, phenols), metals

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report) None

20. Security Class (This Page) None

21. No. of Pages 279

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(See ANSI-Z39.18)

*See Instructions on Reverse*

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Department of Commerce

16. Abstract (Continued)

The selected source control remedial measures include excavation, solvent extraction, and onsite disposal of approximately 31,000 cubic yards of unsaturated soil and dredge pile sediment and approximately 3,000 cubic yards of Meadow Brook sediment followed by installing a soil cover over the treated soil; offsite incineration and disposal of extracted oils containing PCBs; flushing and cleansing portions of the Grant Gear drainage system; cleaning and sealing roof surfaces, and decontaminating machinery, equipment, and floor surfaces in the Grant Gear building which exceed TSCA cleanup levels; ground water collection in a barrier drain trench with onsite treatment by carbon adsorption for PCBs, air stripping for VOCs removal, and precipitation/filtration for metals removal; wetlands restoration; long term environmental monitoring of ground water, soil, sediment and building surfaces; and institutional controls restricting ground water and land use. The estimated present worth cost for this selected remedy is $16,100,000, which includes annual O&M costs for up to 10 years.

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# Declaration of Record of Decision
# Remedial Alternative Selection

## Site Name and Location

Norwood PCB Superfund Site
Norwood, Massachusetts

## Statement of Purpose

This Decision Document presents the selected remedial action for this site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Contingency Plan (NCP); 40 CFR Part 300 *et seq.*, 47 Federal Register 31180 (July 16, 1982), as amended.

The Commonwealth of Massachusetts has concurred with the selected remedy.

## Statement of Basis

This decision is based on the administrative record which was developed in accordance with Section 113(k) of CERCLA and which is available for public review at the information repositories located in the Morrill Memorial Library, Norwood, Massachusetts, and at 90 Canal Street, Boston, Massachusetts. The attached index identifies the items which comprise the administrative record upon which the selection of two remedial action is based.

## Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

## Description of the Selected Remedy

The selected remedial action for the Norwood PCB site consists of source control and management of migration components.

The source control remedial measures include:

- Excavation, treatment by solvent extraction and on-site disposal of approximately 28,500 cubic yards of soils, dredge pile materials and Meadow Brook sediments contaminated at levels exceeding specified soil and sediment cleanup goals. Off-site incineration of the oil extract from the solvent extraction process. A soil cover will be placed over the disposal areas for treated soils. On-site incineration is the contingency remedy for the treatment of soils and sediments;

- Flushing and cleaning of the Grant Gear roof surfaces and drainage system. To the extent that this activity will not satisfy specified action levels, the roof will be encapsulated and the drainage system contained, and replaced.

- Decontamination by solvent washing of equipment, machinery and floor surfaces within the Grant Gear building.

The management of migration measures include:

- Barrier drain trench to collect contaminated on-site overburden and shallow bedrock groundwater. An extraction system consisting conceptually of nine shallow extraction wells is the contingency remedy; and

- Groundwater treatment consisting of carbon adsorption for PCBs removal, air stripping for VOCs removal and precipitation/filtration for metals removal; Groundwater treatment will continue until specified groundwater cleanup levels are achieved.

Additional measures include:

- Wetland restoration/enhancement of on-site wetland areas adversely impacted by remedial action and ancillary activities;

- Long-term environmental monitoring of on-site groundwater, soils, sediments and surfaces within the Grant Gear building; and

- Institutional controls to prevent the use of groundwater in the zone of contamination as a drinking water source and to prevent disturbance of contaminated untreated subsurface soils within the Grant Gear property, sediments within the Grant Gear drainage system and soils under pavement in areas outside Grant Gear.

The estimated present worth cost for the selected remedy, including both source control and management of migration is $16,100,000. The estimate includes capital costs as well as construction and operation and maintenance costs.

## Declaration

The selected remedy and contingency remedies are protective of human health and the environment. The remedies satisfy the statutory preference for treatment that permanently and significantly reduces the volume, toxicity and mobility of the hazardous substances, pollutants and contaminants as a principal element. The selected remedy and the contingent remedies also utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and are cost-effective. The selected remedy and contingency remedies attain federal and state requirements that are applicable or relevant and appropriate (ARARs).

Sept 29, 1989
DATE

Paul Keough
Paul G. Keough
Acting Regional Administrator
EPA-Region I

# ROD DECISION SUMMARY

# NORWOOD PCB SUPERFUND SITE

# NORWOOD, MASSACHUSETTS

SEPTEMBER 29, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION I

## Norwood PCB Superfund Site

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# ROD DECISION SUMMARY

## I. SITE NAME, LOCATION AND DESCRIPTION

**SITE NAME:** Norwood PCB Site
**SITE LOCATION:** Norwood, Norfolk County, Massachusetts
**SITE DESCRIPTION:**

The Norwood PCB Site is located approximately 14 miles southwest of the City of Boston. The 26 acre Site consists of several parcels of land including industrial/commercial properties, associated parking areas and adjacent fields. The Site is bordered to the north by Meadow Brook, to the east by the heavily commercial U.S. Route 1 and the Dean Street access road, to the south by Dean Street, and to the west by the residential Removal Road. Figures 1 and 2 illustrate the study area.

It is estimated that approximately 250 people work within the site boundaries each day. Employers include Grant Gear Works, businesses located in office buildings on Kerry Place, and the Norwood Hyundai automobile dealership. Two residential areas exist near the Site. To the west, approximately 26 homes border the Site on Dean Street and Pellana Road. The other residential area is to the north, separated from the Site by Meadow Brook and a wooded wetlands area. Assuming an average of 3.8 residents per home, there are approximately 3040 residents living within a 1/2 mile radius of the Site.

To the east of the Site is the heavily travelled U.S. Route 1. Properties along U.S. Route 1 in the vicinity of the Site are primarily commercial, and include automobile dealerships, equipment rental businesses, a pet shop, restaurants, and gasoline stations. A restaurant and a Mobil gasoline station are located to the southeast of the site, between the Dean Street access road and Route 1. A shopping plaza, a car wash and two restaurants are located across Dean Street to the south of the Site.

The northern portion of the Site is a small deciduous wooded wetlands area drained by Meadow Brook. Meadow Brook is a shallow stream approximately 12 feet wide and 6 to 12 inches deep near the Site. The brook serves as a drainageway for over 900 acres of densely developed land and discharges into the Neponset River approximately 1,600 feet downstream of the Site. Four piles of sediment previously dredged from the stream (dredge piles) are located on the south bank of the brook, between Route 1 and Kerry Place. The town of Norwood has scheduled the brook for additional dredging and restoration between Dean Street and Meadow Road (3,000 lin. ft.) to reduce the frequency of flooding upstream of the site. Figure 3 shows the extent of the 100-year flood plain.

Two other known sites of contamination are in the vicinity of the Norwood PCB Site. The Mobil gasoline station located between the Dean Street access road and Route 1 was the site of leaking underground storage tanks. Investigations performed at the Norwood Press site, approximately 3,000 feet east of the Norwood PCB Site, revealed the presence of volatile organic compounds (VOCs) in soil, groundwater and surface water. However, results of the RI showed no evidence that contaminants from either site have migrated to the Norwood PCB Site.

All residential and commercial properties within or adjacent to the Site are supplied with water from the Norwood municipal system. The town is provided with public water through a connection to the Massachusetts Water Resource Authority (MWRA) system. It is reported that an undetermined number of residences in the area use private groundwater wells to supply water for gardening and lawn sprinklers.

A more complete description of the Site can be found in Chapter 1 of the RI Report (Ebasco, 1989a).

## II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

### A. Response History

Contamination at the Norwood PCB Site originated from disposal practices of the parties who owned the property or operated businesses in the building located on the property now owned by John and Robert Hurley, Trustees of the Grant Gear Realty Trust. The building was constructed in 1942 by Bendix Aviation Corporation, which produced navigational control systems and conducted other electronic research in the building for the U.S. Navy. In October 1947, the land was purchased by Tobe Deutschman Corporation, which manufactured electrical equipment at the Site, including capacitors and transformers. The property was purchased in October 1956 by Cornell-Dubilier Electronics, Inc., which also manufactured electrical equipment at the facility. In January 1960, the property was briefly owned by Maryvale Corporation, and then purchased by the Friedland Brothers. The Friedland Brothers leased the property to Federal Pacific Electric Company, which held the lease on the property until October 1979. During the period from 1960 to

1979, Federal Pacific Electric operated a business at the Site, and sublet portions of the facility to Cornell-Dubilier Electronics, Inc. and to Arrow Hart Corporation which also manufactured electrical equipment at the facility. Interpretation of aerial photographs from 1952 through 1978 shows that the site fencing extended to Dean Street, encompassing that area identified as a vacant lot and the Norwood Hyundai automobile dealership (Bionetics Corporation, 1984). Throughout this period, the western portion of the Site was undeveloped and used for storage of materials by the owners/operators of the facility.

In 1979, the Site was subdivided. The northeastern portion of the Site, approximately 9 acres, was purchased by Grant Gear Realty Trust which leased the facility to Grant Gear Works, Inc., to produce gears for industry. The southern and western portions of the Site, approximately 16 acres, were purchased by Paul Birmingham, Paul Reardon and Jack Reardon who further subdivided the property into seven lots and added an access road, Kerry Place. The Reardons still retain four of the seven original lots. The lots are now occupied by commercial and light industrial buildings and the Norwood Hyundai automobile dealership. One lot at the corner of Dean Street and Kerry Place remains vacant, but the owners have plans for development.

On April 1, 1983, the Massachusetts Department of Environmental Protection (DEP), then known as the Massachusetts Department of Environmental Quality Engineering, received a telephone call from a citizen living on Pellana Road reporting past industrial waste dumping and contamination in the then vacant field of Kerry Place between Pellana Road and the Grant Gear property. As a result of this call, an initial field investigation by DEP was conducted soon thereafter. On April 6, 1983, DEP sampled surficial soils and Meadow Brook sediments. The initial DEP investigations confirmed PCB contamination in soils. The DEP immediately moved to restrict public access to the field area and marked areas within the Grant Gear fence to alert workers of the possible danger. Because state funds were not available, the Commonwealth of Massachusetts requested EPA to provide support using Superfund money. EPA dispatched their Technical Assistance Team (TAT) Contractor, Roy F. Weston, Inc., of Lexington, Massachusetts, to aid DEP in collecting confirmatory samples of the oil-stained areas along the western fence line and in other areas on both the Grant Gear and Reardon properties. Based on these findings, it was determined that an immediate removal action to address all soils outside the Grant Gear property with PCB concentrations greater than 50 parts per million (ppm) was appropriate. The Agency planned to follow the removal action with a full Remedial Investigation designed to assess the nature and extent of the remaining contamination.

Beginning June 23, 1983, EPA (through their subcontractor, SCA Recycling Industries, Inc., of Braintree, Massachusetts) began removal of contaminated soils on the Site. A total of 518 tons of contaminated soil was removed and disposed at the SCA Model City, New York landfill facility. The soils were removed from locations within the Kerry Place and Grant Gear properties. Reported excavation depths were up to 30 inches. During the removal action, water samples taken from the storm drain system behind the Grant Gear building indicated low levels of PCB contamination. The removal action was completed on August 5, 1983.

In December 1983, the Site was reviewed by the EPA Field Investigation Team (FIT) Contractor and evaluated, using the Hazard Ranking System, for possible listing on the National Priorities List (NPL) of sites eligible for cleanup under the Superfund program. EPA proposed to add the Site to the NPL on October 15, 1984 (49 FR 40320), and the Site was finally added to the NPL on June 10, 1986 (51 FR 21099).

Based on the preliminary findings of a 1986 Wehran Engineering study for DEP and a 1986 GZA study performed for Cornell-Dubilier, the DEP implemented an Interim Remedial Measure (IRM) at the Site in January 1986. The IRM was considered necessary to limit access to areas of highest surface soil contamination within the fenced area of the Grant Gear property. Specifically, DEP's contractor installed a cap over a 1.5 acre portion of the northwest and southwest corners of the Grant Gear property. The contaminated surface soils were covered with a filter fabric liner and 6 inches of crushed stone. The capped areas were enclosed with a 4 foot high wire mesh fence and the areas were delineated with yellow hazard tape. The locations of the capped areas are shown on Figure 4. Following the IRM, Grant Gear has leased portions of their property, including the covered areas to local dealerships for the storage of new automobiles. Maintenance of the cap is presently monitored and/or performed by DEP.

A more detailed description of the site history can be found in the RI Report (Ebasco, 1989a).

## B. Enforcement History

In June 1983, after EPA committed funds to conduct the removal action at the Site at the request of Massachusetts, EPA offered to the property owners the opportunity to perform the work. The owners of the Kerry Place property and of Grant Gear declined to assume responsibility for the work, and EPA initiated the removal action on June 24, 1983. The removal action ended in August 1983, costing approximately $200,000. At that time, Massachusetts was the lead agency for the Site.

Massachusetts engaged in preliminary negotiations with several former owners and operators to voluntarily perform the RI/FS for the Site. As a result of these negotiations, on August 29, 1985, Cornell-Dubilier Electronics, Inc. (CDE) entered into an agreement with Massachusetts to perform a study to better define the extent of contamination remaining on-site as a first step towards undertaking a full-scale RI/FS. The study report was delivered to Massachusetts in April 1986.

EPA issued information requests concerning prior activities at the Site to the former and current owners and operators of the Site in January 1985. On October 17, 1985, EPA notified 12 parties who were former and current owners or operators of the facility of their potential liability with respect to the Site.

Prior to receiving notice of potential liability from EPA, Grant Gear initiated a civil action in April 1985 against parties who had owned or operated the facility since it was constructed in 1942. John F. Hurley, et al. v. Cornell-Dubilier Electronics, Inc., et al., Civil Action No. 85-1417-Mc (D.C. Mass.). Grant Gear amended its complaint in November 1985 to add several other parties. The Court stayed the litigation initially to allow time for the parties to decide whether to conduct the RI/FS. The stay has been continued pending completion of the RI/FS.

In 1986, Massachusetts again attempted to negotiate with the parties to voluntarily conduct the RI/FS. When an agreement could not be reached, in March 1987 the Commonwealth notified EPA that EPA should assume the responsibility of the lead agency for the Site. Since the RI/FS negotiations had been unsuccessful, EPA moved forward with conducting the RI/FS with Superfund monies.

Grant Gear has been seeking a final settlement of its CERCLA liability as an innocent landowner since 1985. At present, the governments have declined to enter into such a settlement. With passage of the Superfund Amendments and Reauthorization Act of 1986, which expressly authorized EPA to reach final settlements with landowners who qualify under the *de minimis* provisions of Section 122(g)(1)(B) of CERCLA, Grant Gear, EPA and Massachusetts have continued to engage in settlement negotiations. No settlement agreement has been completed.

However, Grant Gear was the subject of an enforcement action by EPA under the federal Clean Water Act for discharging pollutants without the required permit into Meadow Brook, which is classified as an antidegradation stream under the Massachusetts Surface Water Quality Standards. Grant Gear was first notified in November 1984 that it was discharging without a permit required under the National Pollutant Discharge Elimination System (NPDES). Although Grant Gear submitted an application for the NPDES permit in April 1985, it failed to apply to Massachusetts for an antidegradation variance which is required before a discharge to Meadow Brook will be permitted. As a result of Grant Gear's failure to complete its permit application, on September 30, 1988, EPA denied Grant Gear's NPDES permit application. On December 16, 1988, EPA Region I issued an administrative order citing Grant Gear for violations of Section 301 of the Clean Water Act, 33 U.S.C. § 1311, EPA Docket No. I-89-05. The Order required Grant Gear to conduct a study evaluating wastewater disposal alternatives. Grant Gear submitted the required report on August 24, 1989.

Technical comments presented by the PRPs during the public comment period were submitted in writing. A summary of the PRP comments and EPA's responses to those comments are included in the Responsiveness Summary in Appendix A of this ROD. In addition, these documents are included in the Administrative Record for the Site.

Special notice has not been issued in this case to date.

## III. COMMUNITY RELATIONS

Through the Site's history, community concern and involvement has been moderately high. EPA has kept the community and other interested parties apprised of the site activities through informational meetings, fact sheets, press releases and public meetings.

In June 1988, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about remedial activities. On March 16, 1988, EPA held an informational meeting in the Balch Elementary School to describe the plans for the Remedial Investigation and Feasibility Study.

On June 15, 1989, EPA held an informational meeting to discuss the results of the RI and the schedule that EPA and DEP planned to follow in selecting the Superfund remedy for the Site. A third informational meeting to present the Agency's Proposed Plan and the other cleanup alternatives presented in the Feasibility Study was held on August 10, 1989. During both meetings, EPA answered questions from the public.

On August 11, 1989, EPA began a 30 day public comment period to accept public comment on the alternatives presented in the Feasibility Study and the Proposed Plan and on the other documents which were a part of the administrative record for the Site. At that time, EPA made the administrative record available for public review at EPA's offices in Boston and at the Morrill Memorial Library in Norwood, Massachusetts. EPA published a notice and brief description of the Proposed Plan in the Daily Transcript on August 8, 1989 and made the plan available to the public at the Morrill Memorial Library. On August 24, 1989, the Agency held a public hearing to accept any oral comments. A transcript of this meeting and the comments and the Agency's response to comments are included in the attached responsiveness summary.

## IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy was developed by combining components of different source control alternatives and a management of migration alternative to obtain a comprehensive approach for Site remediation. In summary, the remedy consists of nine components:

1. Site preparation;
2. Excavation, treatment and on-site disposal of soils and dredge pile materials;
3. Excavation, treatment and on-site disposal of Meadow Brook sediments;
4. Flushing and containment and replacement of portions of Grant Gear drainage system, cleaning and sealing of roof surfaces, and decontamination of machinery and floor surfaces;
5. Collection of groundwater;
6. Treatment of groundwater;
7. Wetlands restoration/enhancement;
8. Long-term environmental monitoring and five-year reviews; and
9. Institutional controls.

## V. SITE CHARACTERISTICS

EPA conducted field investigations at the Site between September 1987 and May 1989. These investigations were designed to attain the following objectives: (1) conduct a comprehensive characterization of the nature and extent of contamination in the various media at the Site; (2) perform an evaluation of present and future health risks and environmental impacts resulting from the contamination at the Site; and (3) collect sufficient data to be used in preparing a Feasibility Study (FS) to screen potential remedial technologies and assemble and evaluate potential remedial alternatives for the Site.

Chapter 1 of the Draft Final Feasibility Study (Ebasco, 1989c) contains an overview of the results obtained from the RI, while further details regarding sample locations, sample methods and sample analyses are provided in the Final Remedial Investigation Report (Ebasco, 1989a) and Endangerment Assessment Report (Ebasco, 1989b). The significant findings of the remedial investigation are summarized below.

## A. GENERAL

During the field investigations performed by EPA, ten media were sampled at the Site: air, surficial soils, subsurface soils, dredge pile solids, Meadow Brook sediments, surface water, groundwater, Grant Gear building surfaces and water and sediments within the Grant Gear drainage system. Contaminant groups detected that were attributable to the Site include PCBs, volatile organic compounds (VOCs), semi-volatiles (extractables), and metals. The primary PCB detected was Aroclor 1254, but Aroclor 1260 was identified in some subsurface soil samples and other Aroclors were detected in the drainage system. The primary site-related VOCs detected were chlorinated aliphatic hydrocarbons. Semi-volatiles identified as site-related included chlorinated benzenes and other aromatic hydrocarbons including polycyclic aromatic hydrocarbons (PAHs). Site-related metals included cadmium, chromium, copper, nickel, silver and zinc.

Based on the results of the field investigations, EPA has concluded that the sources of contamination at the Norwood PCB Site are surficial and subsurface soils, dredge piles of sediments taken from Meadow Brook, sediments in Meadow Brook and sediments in the drainage system of the building operated by Grant Gear. EPA has further determined that the overburden and bedrock groundwater beneath the Site is contaminated with VOCs and PCBs. The Remedial Investigation documented the highest levels of soil and groundwater contamination is located in an area directly west of the Grant Gear building.

In general, the types and concentrations of contaminants decrease as the distance increases from the highest contamination directly to the west of the Grant Gear building. The pattern is typified, with few exceptions, by the drop in concentration of volatile organics in groundwater in the direction of groundwater flow from the southwestern portion of the Grant Gear property to the northeastern corner of the Site. Surface soil PCB contamination exhibits a similar pattern with the vast majority of the contamination confined to the 9-acre Grant Gear property. The PCB concentrations of Meadow Brook sediments decreased significantly between the Grant Gear outfall and the Neponset River. This is apparently a function of the manner in which PCBs are distributed in the environment: primarily as adsorbed materials to soils and sediments, so that their distribution in Meadow Brook mirrors that of sediment deposition along the brook. On the other hand, Meadow Brook sediments exhibit a comparatively undiminished loading of PAHs throughout Meadow Brook, with the highest values of PAHs detected downstream of Route 1. This may be due to the urban nature of the environment downstream of the Grant Gear outfall. Stormwater runoff from these areas discharge to Meadow Brook and may increase PAH concentrations in Meadow Brook sediments.

## B. HYDROGEOLOGY

Hydrogeological investigations were conducted as part of the RI to characterize groundwater flow and contaminant transport. Based on the geological and geophysical evidence presented in the report, the following conclusions are made:

1. On average, the depth to the water table throughout the Site is less than 10 feet. The direction of groundwater flow in the water table aquifer is northeast in the northern portion of the Site discharging into Meadow Brook and eastward to southeastward in the southern portion of the Site. The eastward to southeastward trend in the southern portion of the Site indicates the effects of the bend in Meadow Brook towards the Neponset River.

2. The shallow bedrock is highly fractured and the fracture planes vary both in frequency and orientation. In general, shallow bedrock exhibits the properties of a porous medium, with groundwater flowing essentially in the same direction as the water table aquifer. Contaminant migration in the shallow bedrock aquifer would be expected to flow towards Meadow Brook.

3. The direction of groundwater flow in deeper bedrock is east-southeast in the vicinity of the Grant Gear property. In the southern portion of the Site, bedrock flow directions trends are to the south-southeast.

On a local scale, groundwater flow in the overburden and shallow bedrock is influenced by surface features (i.e., Meadow Brook). Flow in the deep bedrock is controlled locally by the distribution and orientation of fractures.

## C. SOIL

The geological units directly underlying the ground surface at the Site include outwash plain deposits and fill materials. The outwash plain deposits consist of an extensive layer of gray, fine to coarse sand and gravel, with moderate amounts of pebbles, some cobbles and minor amounts of silt. The thickness of the outwash plain deposits unit varies from 10.6 feet to 51.0 feet.

At the Site, granular fill material was found to vary in thickness from 0 to 9.5 feet and consists of varying amounts of silt and fine to coarse sand and gravel. Test pits installed by GZA in 1986 identified the existence of rubble fill material consisting of wood, metal scrap, metal cable, concrete slabs, cinder blocks and pipes.

Tables 1 and 2 present the frequency of detection, average concentration, and maximum concentration of major contaminants detected in the RI in surficial soils (0.0 - 2.0 feet) and subsurface soils. The horizontal extent of PCB contamination is shown in Figure 4-1 of the RI. Based on the distribution of PCBs, it appears that areas of disposal were located in the western and northern portions of the Grant Gear property, where the highest concentrations (up to 26,000 ppm at one location and more than 1,000 ppm over large areas) and the deepest occurrences (greater than 20 feet) were found. In two locations west of the Grant Gear building, the PCB contamination extends down into the bedrock. The estimated total volume of contaminated soils both saturated and unsaturated with groundwater, with PCB concentrations above 10 ppm is approximately 31,550 yd$^3$, of which about 29,000 yd$^3$ is unsaturated.

During the course of the RI, four residential backyards were sampled. Results of the PCB analysis of these samples indicate that three of the four samples had PCB levels less than 1 ppm. The detected PCB concentration in the fourth sample was relatively low, at 1.7 ppm.

Chlorinated aliphatics, primarily trichloroethene, tetrachloroethene, 1,2-dichloroethenes (total) and vinyl chloride, as well as lower levels of chlorinated ethanes, were detected in surface and subsurface soils. Chlorinated benzenes, primarily 1,2,4-trichlorobenzene, were detected in surficial soils (up to 82 ppb) and subsurface soils (over 110 ppm). PAHs and phenols were also detected in surficial and subsurface soils. All six site-related metals were detected in subsurface soils in concentrations exceeding background criteria. Of these, cadmium, copper, silver and zinc were also found in concentrations exceeding background in surficial soil.

### D. SEDIMENTS (Meadow Brook, Dredge Piles, Drainage System)

Tables 3, 4, and 5 present the frequency of detection, average concentration, and maximum concentration of contaminants detected in the RI in dredge pile sediments, Meadow Brook sediments, and drainage system sediments, respectively. Erosion of contaminated soils and continued discharges from a contaminated drainage system of the Grant Gear building represent sources of sediment contamination in Meadow Brook. Additionally, Meadow Brook receives storm drainage from the large urban watershed that drains into the brook.

Contamination in the Grant Gear drainage system includes PCBs (up to 189,000 ppm in sediments in a manhole leading to the Grant Gear outfall), VOCs (primarily chlorinated ethenes), semi-volatiles (including chlorinated benzenes and PAHs) and metals. Contaminants released to the brook from the Grant Gear drainage system consist primarily of PCBs, VOCs and metals. The studies indicate that the principal transport mechanism for PCBs is the movement of sediments to which the PCBs are attached. A water sample taken at the outfall of the drainage system into Meadow Brook contained 4.2 ppb PCBs, 48 ppb 1,2-dichloroethenes (total) and 39 ppb trichloroethene.

PCBs detected in sediments ranged up to 1,100 ppm in the Meadow Brook sediments and up to 3,850 ppm in the dredge piles. Every sample analyzed downstream of the Grant Gear outfall contained detectable concentrations of Aroclor-1254 with the highest concentrations within 200 feet of the outfall. Concentrations decreased in the direction of flow and all samples below Route 1 contained less than 5 ppm of PCBs. The highest concentrations in the dredge spoil pile sediments were in the pile closest to the Grant Gear outfall. The volume of stream sediments, from Meadow Brook to the Neponset River, containing greater than 1 ppm PCB, is 2,900 $yd^3$. The volume of dredge pile sediments containing more than 1 ppm is 790 $yd^3$.

The only VOC contaminant detected in the sediment that appears to have originated at the Site was chloroform. Site-related semi-volatile organic compounds identified in the stream sediments include 1,2,4-trichlorobenzene up to 130 ppb and phenol up 76 ppb. Concentrations of the latter two contaminants were higher in the stream samples taken closest to the Grant Gear outfall, and all three were found in the Grant Gear drainage system. Therefore, stream sediment contamination is considered to be at least partially attributable to the outfall. The total concentrations of PAHs increase in the downstream direction and are believed to be at least partially attributable to the fact that the brook drains a large urbanized area. PAHs are formed during combustion of fuels and as a result are often detected in urban runoff.

Metals identified in stream sediments that may have originated at the Site include chromium, copper, silver and zinc, of which the latter two also were found in dredge pile sediments. As listed in Table 5, thirteen metals were detected in drainage system sediment samples in concentrations exceeding twice the background level or regional concentrations.

## E. WETLANDS

The identification of wetlands, as described in the RI, is based on their proximity to Meadow Brook and/or identification of wetlands-type flora. Figure 5 shows the six zones of identified wetlands. Of the wetland areas delineated in Figure 5, zone 1 is the most significant both in terms of its areal extent and functional value. In particular, zone 1 is a palustrine wetland system with a surface area of approximately 1.82 acres, extending from Kerry Place to the Route 1 culvert. In general, its wetland boundary follows the top of the banks on both sides of the brook and encompasses a pocket of palustrine wetlands extending into the residential properties along Audubon Road. Of the remaining wetlands, zones 4,5 and 6 are relatively small isolated wetlands within the Grant Gear facility, whereas, zones 2 and 3 are located east of Route 1 in a predominantly urban environment.

## F. SURFACE WATER

As described above, Meadow Brook runs along the northern boundary of the Site. Surface water samples were collected along the length of Meadow Brook (starting approximately 600 feet upstream of the Grant Gear outfall) to the Neponset River. Table 6 presents the frequency of detection, average concentration and maximum concentration of contaminants detected in surface water samples. As indicated in the table, VOCs were detected infrequently at low levels.

VOCs detected in Meadow Brook surface waters that may have been released from the Site included chloroform, 1,1,1-trichloroethane, trichloroethene and tetrachloroethene with a maximum total chlorinated aliphatics concentration of 12 ppb at an upstream location. Even though some of these compounds were detected in the effluent from the Grant Gear outfall at higher concentrations, dilution and

**volatilization quickly reduce the effect of discharge so that downstream and upstream water contaminant levels are approximately the same.**

## G. GROUNDWATER

**EPA investigated the nature and extent of groundwater contamination in two phases: the first one in May 1988 (Phase I) and second one in April 1989 (Phase II). The Phase I investigation included the installation of thirteen groundwater monitoring wells within the Grant Gear facility and three background wells, two on Pellana Road and one on Dean Street. During the Phase II investigation, an additional six monitoring wells were installed, including a well nest in the northeast corner of the Site the point farthest downgradient on-site. In addition, activities performed during the Phase II investigation included sampling and analysis of all previously installed monitoring wells for a total of twenty-six groundwater monitoring wells to confirm that groundwater contamination was still confined to the Site. Figure 6 shows the location of monitoring wells.**

Contaminants detected in collected groundwater samples included PCBs, VOCs and semi-volatiles. Tables 7 and 8 present the frequency of detection, average concentration and maximum concentration of contaminants detected in groundwater samples from the water table and bedrock aquifers.

The chlorinated aliphatics attributable to the site include 1,1,1-trichloroethane, 1,2-dichloroethene, vinyl chloride, and trichloroethene. Chlorinated aliphatic concentrations were highest in wells west of the Grant Gear building. Maximum total concentrations of chlorinated aliphatics in the water table aquifer were 2,179 ppb in MW-1A (Phase I) and 2,270 ppb in MW-B10 (Phase II). These wells are located within 125.0 feet of each other just west of the Grant Gear building. Of the chlorinated aliphatics, trichloroethene was detected at highest concentrations in water table wells of both Phase I (1,800 ppb in MW-1A) and Phase II (1,700 ppb in B-10). Maximum total concentrations of chlorinated aliphatics in the Bedrock aquifer were found in well MW-1B (1,307 ppb Phase I and 1,510 ppb Phase II). Monitoring well MW-1B is also located west of the Grant Gear Building. Vinyl chloride remained the highest concentration detected in an on-site bedrock well (MW-2B). Phase I and Phase II sampling at MW-2B detected vinyl chloride concentrations of 65 ppb and 110 ppb, respectively.

A plume of chlorinated aliphatics is moving in the water table aquifer from the western portion of the Grant Gear property, where TCE is found at more than 1 ppm, to Meadow Brook, where ground water discharges and contaminants volatilize. These contaminant discharges are quickly diluted by stream water. Based on a comparison between in-stream contaminant levels and water quality criteria, these contaminant discharges are not considered to significantly impact water quality in Meadow Brook since surface water sampling did not detect elevated levels within the groundwater discharge area. The Phase II study found no bedrock contamination at the most downgradient portion of the Site indicating that contamination found in well MW-2B has not migrated off-site.

PCB concentrations detected in groundwater remained relatively similar for the most part when comparing the results of the Phase I and Phase II PCB sampling. Monitoring well B-18 showed a decline in concentration from 180 ppb to 12 ppb. Well B-4 had an increase in concentration from 46 ppb to 89 ppb, and MW-2A had a reduction in concentration from 98 ppb to 66 ppb. The highest concentrations still exist west of the Grant Gear building and near other areas of high PCB soil contamination, except for MW-2A. During Phase II sampling, Aroclor-1248 was detected only in groundwater samples from monitoring wells B-10 (1.1 ppb) and MW-1A (4.0 ppb).

The semi-volatiles (chlorobenzenes and chlorophenols) attributable to the Site were detected in the water table aquifer during Phase I and Phase II sampling. The highest total concentration of chlorobenzenes, primarily the chemical chlorobenzene, was detected at 2,125 ppb and 2,413 ppb in monitoring well MW-1A. Chlorophenols (trichlorophenol and pentachlorophenol) were found in monitoring wells MW-1A (10 ppb of trichlorophenol) and B-18 (190 ppb pentachlorophenol) during Phase I sampling. Only pentachlorophenol (210 ppb) was detected during Phase II sampling, in monitoring well B-18. No semi-volatiles were measured above detection limits in the bedrock aquifer during either Phase I or Phase II sampling.

## H. GRANT GEAR BUILDING

The Grant Gear building measures approximately 225 feet by 390 feet, with a floor area of approximately 90,000 square feet. Roof heights vary from 15 feet in office areas to 20 feet in the production area.

In May, 1983, E.C. Jordan performed an investigation for Grant Gear Works, collecting 30 wipe samples from interior surfaces of the Grant Gear building, including 10 samples from floors; 7 from walls reportedly painted prior to sampling, and support columns; 5 from the ceilings, ledges; and beams; and 6 from employee work stations. All samples were analyzed for PCBs.

The highest concentration of PCBs detected was 690 ug/100 $cm^2$, taken from the surface of a dusty ceiling I-beam near the center of the building. PCBs were not detected in the other samples from ceilings, but 110 ug/100 $cm^2$ PCBs were detected in a sample from a ledge. PCB concentrations on vertical surfaces ranged from undetected (<10 ug/100 $cm^2$) in 5 samples to 120 ug/100 $cm^2$ on a column near the southwest corner of the building. Concentrations on floors ranged from <10 to 96 ug/100 $cm^2$ in the northern portion of the building and from 78 to 540 ug/100 $cm^2$ in the Grant Gear Works portion. Concentrations on surfaces of equipment at work stations ranged from undetected (<10 ug/100 $cm^2$) to 200 ug/100 $cm^2$. Workstations were reportedly solvent washed following these analyses.

On May 31, 1988, OSHA collected 14 (PCB Aroclor-1242 and Aroclor-1254) wipe samples inside of the Grant Gear building. Wipe samples were taken after the equipment had been cleaned by Grant Gear. Although the size of the surface areas sampled were not noted, OSHA samples detected no PCB levels.

On May 24, 1989, EPA collected wipe samples of wall, machine and locker surfaces for possible PCB contamination (Aroclor-1254). Analytical results of wall surface samples ranged from nondetectable (less than 0.5 ug/100 $cm^2$) to 4.0 ug/100 $cm^2$. Machine wipe samples ranged from 2.7 ug/100 $cm^2$ to 16 ug/100 $cm^2$. The locker wipe sample had a detection of 18 ug/100 $cm^2$.

Results of analyses of a limited number of samples of gravel that cover the asphalt roof of the Grant Gear building detected contamination of PCBs in the range of 1.8 to 3.1 ppm.

## I. AIR

Outdoor air samples for PCB analysis were taken by EPA in July 1983, after the removal of contaminated soils. Measured PCB concentrations ranged from 0.016 micrograms per cubic meter (ug/$m^3$) along Kerry Place to 3.2 ug/$m^3$ at the rear of the Grant Gear building.

Indoor air samples collected on May 24, 1989, within the Grant Gear building, detected PCB Aroclor-1254 ranging from 1.5 ug/$m^3$ to 3.7 ug/$m^3$. The detected levels were well below OSHA's threshold limit value-time weighted average (TLV-TWA) concentration of 500 ug/$m^3$.

A complete discussion of site characteristics can be found in the RI Report (Ebasco, 1989a).

## VI. SUMMARY OF SITE RISKS

An Endangerment Assessment (EA) was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site. Twenty-two contaminants of concern, listed in Table 9, were selected for evaluation in the EA. These contaminants constitute a representative subset of the more than eighty contaminants identified at the Site during the Remedial Investigation. The twenty-two contaminants were selected to represent potential onsite hazards based on toxicity, level of contamination, and mobility and persistence in the environment.

The EA quantitatively estimated potential human health effects associated with the contaminants of concern in soils, sediments, groundwater, surface water, air and on equipment surfaces through the development of several hypothetical exposure scenarios. Incremental lifetime cancer risks and a measure of the potential for noncarcinogenic adverse health effects were estimated for the various exposure scenarios. For carcinogenic compounds, risks are estimated by multiplying the estimated exposure dose by the cancer potency factor of each contaminant. The product of these two values is an estimate of the incremental cancer risk. For noncarcinogenic compounds, a Hazard Index (HI) value was estimated. This value is a ratio between the estimated exposure dose and the reference dose (Rfd) which represents the amount of toxicant that is unlikely to cause adverse health effects. Generally, if the HI is less than one, the predicted exposure dose is not expected to cause harmful noncarcinogenic human health effects. Where the HI exceeds one, the potential to cause adverse noncarcinogenic human health effects increases as the HI increases.

Exposure scenarios were developed to reflect the potential for exposure to hazardous substances based on the characteristic uses and location of the Site. Factors of special note that are reflected in the Endangerment Assessment are that major portions of the Site contain active businesses with approximately a total of 250 workers, and the northern portion of the Site is a residential wooded area that is adjacent to and drained by Meadow Brook. Additionally, the Endangerment Assessment took into account the facts that access to major portions of the Site is unrestricted and the land is zoned for manufacturing uses.

Direct contact with soil was judged as the most likely exposure route to result in potential health hazards under present site conditions. Although on-site groundwater is not currently used for drinking water, the risks associated with its consumption were evaluated because it is classified as a potential source for drinking water. The EA also evaluated the risks from inhalation of on-site airborne contaminants that volatilize from contaminated groundwater and soils on-site. Other potential human health and environmental risks associated with direct contact with contaminated surface water and sediments were also discussed in the EA.

## A. DIRECT CONTACT WITH SURFACE SOILS

### 1. Worker Contact at Grant Gear and Other Commercial Properties

One exposure scenario evaluated the potential exposure and risk for workers through dermal contact with and incidental ingestion of chemicals of potential concern in surface soils at commercial properties within the site boundaries. The affected workers would be exposed on-site from landscaping activities or storing materials on the contaminated soils. The risks were assessed assuming both mean contaminant concentrations and maximum concentrations. A range of probable absorption rates for different chemicals (i.e., VOCs, SVOCs, PCBs, and inorganics) was used to estimate body dose.

The incremental carcinogenic risks for a worker in the vicinity of the Grant Gear facility coming in contact with surface soil on-site ranged from $1x10^{-5}$ using site-wide average contaminant concentrations to $8x10^{-3}$ using site-wide maximum contaminant concentrations. For a landscape worker at Kerry Place, the Hyundai Dealer and other commercial properties south and east of Grant Gear, the incremental carcinogenic risks ranged from $2x10^{-7}$ using site-wide average contaminant concentrations to $2x10^{-6}$ using site-wide maximum contaminant concentrations. For both scenarios, PCBs and total carcinogenic PAHs contributed the majority of the total risk.

Noncarcinogenic risk estimates were also specified for the worker exposure scenarios. In both cases, hazard indices (HIs) calculated for exposure to contaminated surface soil by on-site workers are all less than one, indicating the predicted exposure dose is not expected to cause harmful noncarcinogenic human health effects.

## 2. Residential Contact North of Grant Gear

Two scenarios were presented in the EA to evaluate the potential exposure and risk through dermal contact and incidental ingestion of chemicals of potential concern in dredge piles and/or surface soils in on-site areas north of the Grant Gear facility. The first scenario assumes an older child frequents this area and has contact with dredge piles or soils in this area. The second scenario assumes local residents are exposed to chemicals of concern in surface soils in their backyards by outdoor activities such as playing or gardening.

Calculated incremental carcinogenic risks were determined to be greater for a child exposed to contaminated dredge piles or soils in the wooded area north of Grant Gear than for residents contacting contaminated soils in their backyards. The incremental lifetime carcinogenic risks for an older child exposed to contaminated dredge piles and surface soils in the wooded area north of Grant Gear ranged from $2x10^{-6}$ to $6x10^{-4}$. In comparison, for residents contacting contaminated soils in their backyards, incremental lifetime carcinogenic risks ranged from $2x10^{-7}$ to $3x10^{-6}$, reflecting the lower concentrations of chemicals of concern in the residential backyards. In both scenarios, PCBs and total carcinogenic PAHs contribute the majority of the total risk and calculated hazard indices are less than one.

## B. Ingestion of Groundwater

Groundwater on-site is not currently used for drinking water, but it does represent a potential future source. According to EPA Groundwater Protection Strategy guidelines, the aquifer underlying the Site is classified as Class IIB aquifer (i.e., a potential source of potable water). Under the Massachusetts DEP classification system, the aquifer is considered Class I, based on the same potential use. Therefore, the incremental lifetime carcinogenic risk and the noncarcinogenic health risks associated with the ingestion of contaminated groundwater were assessed.

The EA estimated that the total incremental carcinogenic risk would be $1x10^{-3}$ and $4x10^{-2}$ if a person were to drink for a lifetime the groundwater found under the Site containing contaminants of concern at the mean and maximum concentrations, respectively (based on the Phase I results). Vinyl chloride and PCBs contributed over 99 percent of the total carcinogenic risk. For ingestion of groundwater containing contaminants of concern at the maximum concentrations, the total estimated exposure dose exceeds a HI of one. Therefore, there is also an increased potential to cause adverse noncarcinogenic human health effects. The hazard index associated with ingestion for a lifetime of groundwater containing contaminants of concern at the maximum concentrations, based on Phase I sampling, was estimated at 10. In that case, 1,2,4-trichlorobenzene and trichloroethene contributed over 99 percent of the total noncarcinogenic risk.

### C. Exposure to Sediments

The Endangerment Assessment examined risks associated with exposure to contaminated sediments in Meadow Brook, including exposure scenarios involving direct contact with or incidental ingestion of sediments by a child. The highest incremental carcinogenic risk was $5 \times 10^{-5}$, based on direct contact by an older child with the maximum concentrations of contaminated sediments in Meadow Brook.

The EA also evaluated potential impacts to environmental receptors exposed to contaminated sediments. For the small mammals, rodents and aquatic organisms that inhabit the area, the potential exists for exposure to site associated contaminants through the skin, by ingestion or through the food chain. Of greatest concern is exposure to PCBs because they are difficult to eliminate from the body and may affect the animals and other organisms.

Two approaches were used to evaluate the environmental risk posed by the contaminated sediments. The first approach was to determine levels of PCBs and total organic carbon (TOC) at various sampling locations, and then to compare those values to the Interim Sediment Quality Criteria (SQC), which vary depending on the TOC value. The sediment quality criteria are numbers which predict the relationship between contaminant levels in sediments and the Ambient Water Quality Criteria (AWQC) which protects wildlife that consume aquatic organisms.[1] There are three levels of SQCs.[2] The upper level represents a 97.5% probability that PCB levels in interstitial water (the water between sediment particles) will exceed AWQCs. The mean level represents a 50% probability of the same event, and the lower level represents a 2.5% probability. Generally, the greater the probability of PCB levels exceeding AWQCs, the greater the risk to wildlife that consume aquatic organisms.

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[1] For PCBs, the ambient water quality criterion for the protection of aquatic life to allow safe consumption of aquatic organisms by wildlife is 0.014 ug/l.

[2] The derivation of upper, mean and lower value SQCs are further discussed in Appendix E of the Feasibility Study.

At the Norwood PCB Site, PCBs in sediments exceeded both the mean SQC value of 20 ug PCBs/g TOC and the upper SQC value of 100 ug PCBs/g TOC in most portions of Meadow Brook from the vicinity of the Grant Gear outfall to the Neponset River. In one location near the Grant Gear outfall, the maximum PCB concentration detected in Meadow Brook sediments was 200 times greater than the upper SQC value. Based on these comparisons between the SQCs for PCBs and measured PCB levels in sediments, EPA has determined that potential risks to wildlife exist through consumption of aquatic organisms exposed to PCB-contaminated sediments within Meadow Brook.

The second approach was used to assess risks to the aquatic organisms in contact with the PCB-contaminated sediments. The PCB tissue concentrations of these aquatic organisms are projected to be equal to or, in some cases, in excess of those concentrations in the sediment. Assuming a sediment to tissue Bioconcentration Factor (BCF) of 1, the range of PCB tissue concentrations in aquatic organisms exposed to contaminated sediments in Meadow Brook are estimated at less than 1.0 to 200 ppm. PCB tissue concentrations higher than 0.4 ppm in freshwater fish have been associated with reproductive impairment. Therefore, based on assumed tissue levels in aquatic organisms, aquatic organisms exposed to contaminated sediments in Meadow Brook may be at risk of reproductive impairment or other adverse effects.

### D. Exposure to Contaminated Machinery/Equipment Surfaces

Risks to workers within Grant Gear from contact with and dermal absorption of PCBs on indoor wall and equipment surfaces were evaluated using results from wipe samples taken by EPA in May 1989. For worker contact with PCBs on indoor walls, the incremental carcinogenic risk was $2x10^{-6}$ using mean PCB concentrations and $3x10^{-6}$ using the maximum PCB concentration. Worker exposure to mean PCB concentrations detected on equipment surfaces resulted in an incremental carcinogenic risk of $2x10^{-5}$; whereas, exposure to the maximum PCB concentration resulted in an incremental carcinogenic risk of $5x10^{-5}$.

In summary, actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present an imminent and substantial endangerment to public health, welfare or the environment.

A complete discussion of human health and environmental risks can be found in the Endangerment Assessment (Ebasco, 1989b). Table 10 summarizes human health risks associated with current and future site use.

## VII. DOCUMENTATION OF SIGNIFICANT CHANGES

**EPA adopted a proposed plan (preferred alternative) for remediation of the Site on August 8, 1989. Components of the preferred alternative included:**

1. **Site preparation;**
2. **Excavation, treatment and on-site disposal of soils and dredge pile materials;**
3. **Excavation, treatment and on-site disposal of Meadow Brook sediments;**
4. **Flushing and/or containment and replacement of portions of the Grant Gear drainage system, cleaning and sealing of roof surfaces, decontamination of machinery/equipment and floor surfaces;**
5. Collection of groundwater from the on-site overburden and bedrock aquifers;
6. Treatment of groundwater;
7. Wetlands restoration/enhancement;
8. Long-term environmental monitoring and five-year reviews; and
9. Institutional controls.

The remedy selected in this document differs from the proposed plan in two respects. The first difference is regarding the cleanup levels for contaminated machinery or office equipment surfaces within the Grant Gear building. The selected remedy establishes a target cleanup level of 5 ug/100cm$^2$ for such equipment. The proposed plan specified a Grant Gear machinery and office equipment surfaces cleanup goal of 10 ug/100cm$^2$ for total PCBs. This cleanup level of 10 ug/100cm$^2$ is consistent with the EPA's PCB Spill Policy for indoor solid surfaces set forth at 40 CFR 761.125(c)(4). However, after the proposed plan was published, the Endangerment Assessment was finalized which concluded that the target cleanup level should be 5 ug/100cm$^2$ in order to reduce the residual risk to a maximum risk of 1x10$^{-5}$. The selected remedy will use the same remedial action (decontamination) for reducing the PCB levels to the revised target cleanup level as was proposed in the preferred alternative. A memo outlining the change in cleanup goals was added to the administrative record for the Site on August 18, 1989, during the public comment period. In addition, the change was described at the informal public hearing on August 24, 1989.

The second difference from the Proposed Plan is that floor surfaces within the plant areas of the Grant Gear facility will be decontaminated as a component of the selected remedy. The selected remedy established a performance based target cleanup level of 10 ug/100 cm$^2$ for floor surfaces within the Grant Gear building. The Proposed Plan outlined a preferred alternative which addressed contamination of equipment and machinery surfaces within the plant areas of the Grant Gear building but not floors. This alternative specified decontamination of equipment surfaces by solvent washing. In addition, an equipment cleanup target level of 5 ug/100cm$^2$ was established based on the site-specific risk exposure assumptions described in the EA. EPA did not include floor decontamination in the Proposed Plan because of the assumed infrequent exposure of workers from direct contact with contaminants on floor surfaces. Comments on the Proposed Plan received during the public comment period indicated that the selected remedy should include decontamination of floor surfaces within the Grant Gear building. Specifically, comments submitted by Grant Gear recommended that the remedy should address PCB contamination of the floor as a source of contamination inside the building. Finally, the Commonwealth of Massachusetts has expressed a preference for remediation of the contaminated floors within Grant Gear in order to reduce the total risks and to reduce the levels of contaminants at the Site to background levels, to the extent feasible. Moreover, since issuance of the Proposed Plan, EPA has determined that as a source control measure, decontamination of the floor surfaces is necessary to minimize the potential for migration of PCBs into the air, and subsequent recontamination of equipment and machinery. Therefore, decontamination of floor surfaces is necessary to adequately reduce long-term risks to workers from exposure to contaminated surfaces. In addition, this measure at a relatively low cost will further reduce, to the extent that PCBs on the floor volatilize into the air, the risks to workers associated with inhalation of PCBs.

EPA finds that these significant changes to the proposed remedy are logical outgrowths of information available to the public from the information and analysis presented in the RI, EA, FS and in the Proposed Plan. For these reasons, these changes are documented in this ROD; further public comment is not necessary.

## VIII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

### A. Statutory Requirements/Response Objectives

Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), actions taken in response to releases of hazardous substances were conducted in accordance with CERCLA as enacted in 1980 and the revised National Oil and Hazardous Substances Pollution Contingency

Plan (NCP), 40 C.F.R. Part 300 (1988), promulgated in the Federal Register on November 20, 1985. Although EPA proposed revisions on December 21, 1988, to the NCP to reflect SARA, until those proposed revisions are finalized, the procedures and standards for responding to releases of hazardous substances, pollutants and contaminants shall be in accordance with Section 121 of CERCLA and, to the maximum extent practicable, the current NCP.

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances over remedies that do not achieve such results through treatment. Response alternatives were developed to be consistent with these Congressional mandates.

A number of potential exposure pathways were analyzed for risk and threats to human health and the environment in the Endangerment Assessment. Guidelines in the Superfund Public Health Evaluation Manual (EPA, 1986) regarding development of risk analyses for remedial alternatives were used to assist EPA in the development of response actions. As a result of these assessments, remedial response objectives were developed to mitigate existing and future threats to human health and the environment. These response objectives are:

1. Prevent or mitigate the continued release of hazardous substances from contaminated soils and sediments to groundwater, air, and surface water;
2. Reduce risks to human health and environmental receptors associated with direct contact with or incidental ingestion of site contaminants in surface and subsurface soils;
3. Reduce risks to human health and environmental receptors associated with direct contact with and incidental ingestion of Meadow Brook sediments;
4. Prevent or mitigate the release of hazardous substances to Meadow Brook from the Grant Gear drainage system;

**5. Reduce risks to workers associated with inhalation of PCBs and direct contact with PCB-contaminated surfaces within the Grant Gear building;**
**6. Reduce risks to human health associated with potential future consumption of groundwater;**
**7. Reduce risks to human health and the environment from current and future migration of contaminants in groundwater and surface water; and**
**8. Reduce risks to human health associated with potential current and future inhalation of airborne organic compounds released from the Site.**

## B. Technology and Alternative Development and Screening

CERCLA, the NCP and EPA guidance documents, including, the "Guidance on Feasibility Studies Under CERCLA" dated June 1985, the "Interim Guidance on Superfund Selection of Remedy" [EPA Office of Solid Waste and Emergency Response (OSWER)], Directive No. 9355.0-19 (December 24, 1986), and the Interim Final "Guidance for Conducting RIs and FSs under CERCLA," OSWER Directive No. 9355.3-01, set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements and guidance documents, a range of treatment alternatives, a containment option involving little or no treatment, and a no-action alternative were developed for the Site.

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. In addition to these factors and the other statutory directives of Section 121 of CERCLA, the evaluation and selection process was guided by the EPA document "Additional Interim Guidance for FY '87 Records of Decision" dated July 24, 1987. This document provides direction on the consideration of SARA cleanup standards and sets forth nine factors that EPA should consider in its evaluation and selection of remedial actions. The nine factors are:

1. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).

2. Long-term Effectiveness and Permanence.

3. Reduction of Toxicity, Mobility or Volume.

4. Short-term Effectiveness.

5. Implementability.

6. Community Acceptance.

7. **State Acceptance.**

8. **Cost.**

9. **Overall Protection of Human Health and the Environment.**

**Chapter 4 of the Norwood PCB Site Feasibility Study (Ebasco, 1989c) identified, assessed and screened technologies based on implementability, effectiveness, and cost. These technologies were combined into source control (SC) and management of migration (MM) alternatives. Chapter 5 of this Feasibility Study presented the remedial alternatives developed by combining the technologies identified in the previous screening process in the categories required by OSWER Directive No. 9355.0-19. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Chapter 5 of the Feasibility Study (Ebasco, 1989c). In summary, of the 12 source control and management of migration remedial alternatives screened in Chapter 5, 9 were retained for detailed analysis.**

Chapter 4 of the Grant Gear Building Feasibility Study (CDM, 1989) identified and screened alternatives for remediation of the building's drainage system based on effectiveness, implementability and cost. Of the 7 alternatives screened, 4 were retained for detailed analysis.

Table 11 identifies the 13 alternatives that were retained through the screening process, as well as those that were eliminated from further consideration.

## IX. DESCRIPTION/SUMMARY OF THE DETAILED AND COMPARATIVE ANALYSIS OF ALTERNATIVES

This section presents a narrative summary and brief evaluation of each alternative according to the evaluation criteria described above. A detailed tabular assessment of alternatives SC-1 through SC-5 and MM-1 through MM-4 can be found in Tables 12 and 13.

### A. Source Control (SC) Alternatives Analyzed

The source control alternatives to address soil and sediment contamination at the Site include a minimal action alternative (SC-1); a containment alternative (SC-2); and three treatment alternatives: on-site solvent extraction (SC-3); on-site dechlorination (SC-4); and on-site incineration (SC-5). The source control alternatives to address Grant Gear drainage system contamination include a no action alternative (SC-A); flushing/cleaning of the

**drainage system (SC-B); containment of the drainage system (SC-C); and removal of the drainage system (SC-D).**

**A detailed evaluation of the source control alternatives to address soil and sediment contamination at the Site is presented in Chapter 6 of the FS Norwood PCB Site (Ebasco, 1989c). A detailed evaluation of the source control alternatives to address the Grant Gear drainage system contamination is presented in Chapter 5 of the Grant Gear Building FS (CDM, 1989).**

**As described in the Grant Gear Building FS (CDM, 1989), three remedial alternatives to address contamination of surfaces inside the building were screened: sandblasting, decontamination and removal. Sandblasting was screened out based primarily on the uncertainty of its effectiveness in reducing contaminant levels on metal and concrete surfaces to target cleanup levels. In addition, the implementability of sandblasting is questionable considering the significant short-term risks to workers through increased airborne particulates and contaminants during its implementation. The off-site removal alternative was also screened out because this alternative would be excessively costly without any reduction in toxicity, mobility or volume of hazardous substances. Additional disadvantages include** implementability problems associated with the transportation and disposal of a significant mass and volume of contaminated equipment and machinery. Both sandblasting and off-site disposal would result in significant disruption of and damage to the Grant Gear operations and building. On the other hand, decontamination will be readily implementable, would permanently and significantly reduce the mobility and volume of contaminants on surfaces, and will be effective in the long-term in achieving levels protective of human health and the environment. EPA has determined that decontamination, unlike sandblasting and off-site disposal, will be readily implementable and will meet all the statutory requirements under CERCLA. Because only one alternative (decontamination) passed the initial screening, no detailed analysis of the alternative for remediation of contaminated surfaces was performed. This determination also applies to contamination of floor surfaces.

The source control alternatives for the remaining site contamination are summarized below:

SC-1
Minimal Action

A strict no action alternative was not evaluated in the detailed analysis of source control alternatives for remediation of on-site soils, dredge pile materials and sediments. Instead, a minimal action alternative was evaluated, as described below. A no action alternative would be less acceptable than the minimal action alternative primarily because it would not reduce of the level unacceptable current or future risks to human health and the environment posed by exposure to site contaminants.

This minimal action alternative would consist primarily of restricting access to on-site contaminants. The major items associated with this alternative are as follows:

- Construction of a site perimeter fence
- Institutional controls limiting groundwater and land use (i.e. deed restrictions)
- Public educational programs, including public meetings and presentations, to increase public awareness
- Long-term environmental sampling and analysis to monitor contaminant concentrations and migration
- Site review every five years

This alternative would not be protective because it does not address human health and environmental risks due to exposure to soils, sediments and groundwater. In particular, worker contact with surface soil in the vicinity of Grant Gear would remain in excess of a $10^{-3}$ risk under the plausible maximum case. VOCs in the soils would continue to contaminate groundwater and extend the period needed to restore the aquifer. VOCs would also continue to be released into the air and present risks to workers on-site. Surface water run-off and erosion from the PCB contaminated soils would continue to contribute to risks to aquatic organisms exposed to contaminated sediments in Meadow Brook.

This alternative is not permanent and is ineffective in reducing what are presently unacceptable risks in the short-term or long-term. This alternative would not use treatment as a principal element to address the mass of contamination at the Site, and consequently, there would be no reduction in mobility, toxicity or volume of wastes present at the Site. In addition, this alternative would not attain State ARARs for groundwater quality and surface water. Finally, none of the comments received from the community or state support a no action alternative.

The only advantage associated with this alternative is that all components would be readily implemented with no unforseen difficulties anticipated during construction of the fence.

Alternative SC-1 Costs:

**ESTIMATED TIME FOR IMPLEMENTATION: < 1 YEAR**
**ESTIMATED CAPITAL COST: $128,000**
**ESTIMATED O & M (Present Worth): $954,000**
**ESTIMATED TOTAL COST (Present Worth): $1,082,000**

### SC-2 (SC-2A/SC-2B)
### Capping of Soils and Sediments

**The SC-2 alternative would consist of consolidating outlying contaminated soils, dredge pile solids, and sediments under an impermeable cap constructed on-site over the central zone of contamination. Two capping scenarios (SC-2A and SC-2B) were evaluated in the FS based on different volumes of sediments to be excavated. For Alternative SC-2A, Meadow Brook sediments with PCB concentrations exceeding 10 ppm, dredge pile materials, and contaminated soils excavated from the area located between Meadow Brook and the existing site fence and from the area extending south beyond the Grant Gear property line into the vacant lot, would be temporarily stockpiled at the Site. The difference for Alternative SC-2B is that Meadow Brook sediments with PCB concentrations greater than 1 ppm would be excavated and temporarily stockpiled at the site. All excavated areas would be returned to their original grade with purchased clean fill and topsoil.**

For both SC-2A and SC-2B, initial site work would include construction of a fence, installation of erosion control measures and clearing and regrading. Outlying soils and sediments would be excavated and consolidated in one area and stockpiled on-site. Conceptually, all stockpiled solids would be spread and compacted over a 5.3-acre area on the Site, covering most of the Grant Gear property south, west, and north of the building. The contaminated material would be approximately six feet thick. An impermeable cap would be constructed over the contaminated materials consisting of a four-inch thick gravel base, a synthetic liner composed of high density polyethylene (HDPE) liner, and a two-inch gravel drainage layer. A three-inch thick asphalt layer would cover these base layers and drainage materials. The cap would require annual maintenance and inspections to ensure the integrity of the cap. Long-term environmental monitoring, including sediment and surface water sampling, would also be required. Because untreated contaminated soil would remain on-site, soil and groundwater samples would be collected annually from areas adjacent to the cap.

The capping alternatives would be readily implementable, but could result in short-term adverse environmental impacts during site preparation activities and excavation. Although the site area was considered too small for a landfill designed to meet minimum technology requirements under RCRA, there would be sufficient space to construct the landfill described for these alternatives. These alternatives would reduce contaminant mobility. Risks from direct contact with and incidental ingestion of contaminants in on-site soils, dredge pile materials and sediments would essentially be reduced to zero in the short-term due to the cap's elimination of these exposure pathways. Alternative SC-2B would provide increased reduction of risks to the environment because sediments with PCB concentrations greater than 1 ppm would be excavated. These alternatives would not treat contaminated solids to reduce the total mass of PCBs and would not result in a reduction in contaminant toxicity or volume.

Capping would result in overall short-term protectiveness of human health due to reduction in direct human exposure to contaminated soils and sediments. However, there is uncertainty about the long-term effectiveness of the cap and the potential for significant risks to human health and the environment from the untreated wastes, as well as future costs, if the cap were to fail. As a landfill, this alternative would not be a permanent solution and would require long-term operation and maintenance. This alternative is not supported by the state or the community.

Alternative SC-2A Costs:
ESTIMATED TIME FOR CONSTRUCTION: < 1 YEAR
ESTIMATED TOTAL CAPITAL COSTS: $2,133,000
ESTIMATED OPERATION & MAINTENANCE COSTS: $1,567,000
ESTIMATED TOTAL PRESENT WORTH: $3,700,000

Alternative SC-2B Costs:
ESTIMATED TIME FOR CONSTRUCTION: < 1 YEAR
ESTIMATED TOTAL CAPITAL COSTS: $2,340,000
ESTIMATED OPERATION & MAINTENANCE COSTS: $1,657,000
ESTIMATED TOTAL PRESENT WORTH: $3,997,000

### SC-3
### On-Site Solvent Extraction

This alternative is a component of the overall source control remedial alternative selected for the Site. Refer to Section X, for a discussion of this alternative.

Alternative SC-3 Costs:
ESTIMATED TIME FOR OPERATION: 2 YEARS
ESTIMATED TOTAL CAPITOL COSTS: $10,749,000
ESTIMATED OPERATION & MAINTENANCE COSTS: $2,511,000
ESTIMATED TOTAL PRESENT WORTH: $13,260,000

### SC-4
### On-Site Dechlorination

**In this alternative, as in the selected remedy, approximately 28,500 cy of contaminated soils and sediments would be excavated, treated and disposed of on-site. However, this alternative would utilize a dechlorination technology to detoxify the PCB contamination. Major components of Alternative SC-4 would be as follows:**

- **Site preparation work;**
- **Construction of a fence;**
- **Construction of stockpiling and treatment areas;**
- **Mobilization of treatment process equipment;**
- **Excavation/treatment of solids;**
- **On-site disposal of treated solids;**
- **Placement of soil covering;**
- **Revegetation/repaving of disturbed areas;**
- **Demobilization and decontamination of equipment;**
- **Wetlands restoration;**
- **Institutional controls;**
- **Long-term monitoring; and**
- **5-year reviews.**

The dechlorination treatment process, termed the alkali metal dechlorination process (APEG), removes chlorine atoms from PCB molecules leaving less toxic, biphenyl molecules as residuals. Contaminated solids are mixed in a stainless steel reaction vessel with a combination of chemicals forming a reagent, APEG (alkali polyethylene glycol). The mixture is heated to increase the rate of reaction of the PCBs, and to drive off the volatile organics (VOCs) from the soil. The slurry mixture is then subjected to a series of washing and dewatering steps. Contaminated reagent would be continually recycled. Exhausted reagent and any hazardous treatment byproduct, if generated, would be transported to an off-site incineration facility for final destruction and disposal. As outlined above, treated solids would be replaced on-site and covered with topsoil.

By detoxifying PCBs, the principal chemical of concern at the Site, this alternative would significantly reduce risks to human health and the environment posed by direct contact with and incidental ingestion of PCB-contaminated soils and sediments. Dechlorination would permanently and significantly reduce the toxicity, mobility and volume of contaminants, would utilize an alternative treatment technology and would comply with ARARs. Short-term risks posed by dust or VOC emissions during soil excavation activities would be controlled during implementation.

Dechlorination would not be readily implementable because it would require the construction of a mobile treatment unit for which no full-scale, demonstrated unit currently exists.

**The reliability and long-term effectiveness of this innovative treatment technology includes, at present, some degree of uncertainty since performance tests have shown significant variability in the concentrations of the APEG-reagent and PCBs remaining in the treated soil. Finally, although this treatment would be effective in reducing PCB levels in on-site soils and sediments to protective levels, it may not be effective in reducing PAH levels in on-site soils to protective levels.**

**ESTIMATED TIME FOR OPERATION: 2.5 YEARS**
**ESTIMATED CAPITOL COSTS: $10,997,000**
**ESTIMATED OPERATION & MAINTENANCE COSTS: $4,636,000**
**ESTIMATED TOTAL PRESENT WORTH: $15,633,000**

### SC-5
### On-Site Incineration

As in the selected remedy, approximately 28,500 cy of contaminated soils and sediments would be excavated, treated on-site by incineration,and disposed of on-site. The major components of SC-5 would be the same as SC-4. This alternative is selected as the backup treatment for contaminated soils and sediments if results of predesign studies indicate that the selected treatment technology (solvent extraction) would not be implementable or would not be effective in reducing contaminant levels to soil target cleanup levels.

Three different types of incinerators were evaluated: rotary kiln, circulating fluidized bed and infrared processing. The specific type of process (e.g. rotary kiln) would be determined in the Remedial Design phase through engineering design and analysis and the competitive bidding process. Specific operating practices necessary to meet performance objectives, including a 99.9999 percent destruction and removal efficiency (DRE) of stack emissions as required by EPA regulations in 40 CFR Part 761, would be determined through a trial burn at the Site. This trial burn would be conducted on-site to demonstrate the effectiveness and efficiency of the unit in providing for the destruction of the contaminants specific to the Norwood PCB Site, and to verify that residues from the incineration process are nonhazardous. Exhaust gases would be passed through air pollution devices before being released into the atmosphere. All incinerated residues would be replaced on-site and would be covered with a layer of topsoil and revegetated or repaved as necessary. Any contaminated water residuals associated with dewatering of solids and from emission control devices would be stored on-site to be treated in the on-site groundwater treatment system selected for the management of migration component of the remedy.

**On-site incineration of contaminated soils and sediments is readily implementable. This alternative would reduce risks associated with direct contact with and ingestion of contaminated soils and sediments. Incineration would permanently destroy PCBs and PAHs, would reduce the volume, mobility and toxicity of contaminants, and would comply with ARARs. It would provide overall protection of human health and the environment because it significantly decreases contaminant concentrations to protective levels. Incineration is a proven and highly effective technology.**

**ESTIMATED TIME FOR OPERATION: 2 YEARS**
**ESTIMATED TOTAL CAPITAL COSTS: $13,856,000**
**ESTIMATED OPERATION & MAINTENANCE COSTS: $3,263,000**
**ESTIMATED TOTAL PRESENT WORTH: $17,119,000**

### Alternatives to Address Grant Gear Drainage System Contamination

### SC-A
### No Action

Analysis of the no action alternative is required by the NCP and is included for comparison with other alternatives. This alternative assumes that the building will continue without modification and without change of occupancy or use. In this alternative, contaminated sediments would remain untreated within the pipes and manholes of the drainage system.

As with SC-1, this alternative would not result in the reduction of toxicity, mobility or volume of contaminants in the drainage system, which would continue to migrate into Meadow Brook. The continued unabated discharge would not attain ARARs (i.e., Clean Water Act) and would not be protective due to exposure to contaminants in sediments above protective levels. Since the selected remedy will remove PCB-contaminated sediments in Meadow Brook at levels greater than 1 ppm, the continued discharge would recontaminate the stream, and therefore be ineffective in the long-term.

Costs associated with this alternative would be generated only by long-term monitoring requirements.

ESTIMATED TOTAL COST: $57,000

### SC-B
### Flushing/Cleaning

This alternative is a component of the overall source control remedial alternative selected for the Site. Refer to Section X, for a discussion of this alternative.

**ESTIMATED TOTAL COST: $99,000**

**SC-C**
**Containment**

This alternative incorporates flushing and cleaning as its first component to reduce the levels of contaminants in the drainage system. After the initial flushing and cleaning step, the pipes and manholes of the existing drainage system would be filled with concrete or a soil/bentonite/cement slurry and abandoned in-place. A new drainage system would be installed above grade, with drains supported on brackets welded or bolted to the existing building columns. The discharge of collected stormwater would be directed to Meadow Brook via a new outfall pipe.

By reducing contaminant levels discharged to Meadow Brook to protective levels, this alternative would be protective of human health and the environment. By use of the flushing step and subsequent treatment of the purged solids, this alternative would reduce the mobility, toxicity and volume of hazardous compounds within the Grant Gear drainage system. Upon successful implementation, this alternative would eliminate the existing release of PCBs to Meadow Brook while complying with ARARs (i.e., Clean Water Act). The material and equipment needed to carry out this alternative are readily available, thus making this alternative very implementable.

However, this alternative is a containment option that would not utilize treatment to permanently reduce the toxicity, mobility or volume of site contaminants. In addition, this alternative would require long-term monitoring, institutional controls and five-year reviews.

ESTIMATED TOTAL COST: $240,000

SC-D
Removal of Drainage System

Under this alternative, all piping and manholes contaminated with hazardous substances would be removed and transported to an approved off-site facility for disposal. In order to remove the drainage system, the alternative would need to remove portions of the floors and walls. Machines within the Grant Gear building would have to be moved, protected and reinstalled. Special precautions would be taken to protect personnel during excavation. Furthermore, all surfaces within the building would be decontaminated after the removal to ensure that all contaminated dust generated during the demolition was removed. Prior to removing the drainage pipes, they would first be flushed to remove easily dislodged contamination to mitigate to the extent feasible the release of hazardous substances during removal operations. As described in SC-C, portions of the drainage system would then be replaced, as necessary, with new above-grade piping and manholes.

This alternative would permanently stop the discharge of hazardous compounds to Meadow Brook and thus would be protective of human health and the environment. However, implementability of this alternative is limited because it would result in major disruption to the operations of Grant Gear. Because drain lines are within walls and under the floors, removal of the piping system would also involve major excavation of and damage to building structures. By use of the flushing step and subsequent treatment of the purged solids, this alternative would significantly but not permanently reduce the mobility, toxicity and volume of hazardous compounds within the Grant Gear drainage system. Although this alternative would significantly and permanently reduce on-site contamination in the drainage system, off-site disposal in a landfill would not permanently treat the contaminants and is the least preferred under CERCLA. Finally, excavation and demolition activities, and activities to prepare the materials for transportation may result in a release of hazardous substances and thus may pose short-term risks to workers.

ESTIMATED TOTAL COST: $440,000

### B. Management of Migration (MM) Alternatives Analyzed

Management of migration alternatives address contaminants that have migrated from the original source of contamination. At the Norwood PCB Site, contaminants have leached from contaminated soils in the areas of the western portion of the Grant Gear facility into the groundwater under the Site. The plume of contaminated groundwater is moving in general, toward Meadow Brook.

Chapter 7 of the Feasibility Study presents the detailed evaluation of management of migration alternatives including a minimal no action (MM-1); three groundwater collection and treatment alternatives; air stripping (MM-2); carbon adsorption (MM-3); and ultraviolet/oxidation (MM-4).

The groundwater collection system developed for use with each treatment technology (MM-2, MM-3 and MM-4) is described in component (e) of the selected remedy (See Section X).

**MM-1**
**Minimal Action**

A strict no action alternative was not evaluated in the detailed analysis of management of migration alternatives. Instead, a minimal action alternative was evaluated, as described below. A no action alternative would be less acceptable than the minimal action alternative primarily because it would no reduce the unacceptable current or future risks to human health and the environment posed by exposure to site contaminants.

In the minimal action alternative, institutional controls in the form of deed restrictions would prevent groundwater use in areas of known groundwater contamination. Periodic public meetings would be implemented to increase public awareness of the hazards at the Site. No treatment or removal of groundwater would be included in this alternative. Because this alternative would not restrict groundwater flows and would not treat groundwater, migration of contaminants would continue. Additional on- and off-site monitoring wells in both the water table and bedrock aquifers would be included in this alternative to monitor the migration of contaminants. Long-term environmental monitoring would be conducted for a period of at least thirty years.

This alternative would be readily implementable and would not result in adverse short-term impacts because the groundwater is not currently used for drinking water. The no action alternative would not reduce the toxicity, mobility or volume of contaminants in groundwater. Hazardous substances would continue to migrate in groundwater to be discharged into Meadow Brook and/or the Neponset River. Although the Remedial Investigation found that site-related groundwater contamination had not migrated downgradient beyond the Site, it is possible that the contaminated plume will migrate further and contaminate a larger portion of the aquifer if the contamination is left unchecked. Contaminant levels in groundwater would not be reduced to comply with groundwater quality and drinking water standards, as required under Massachusetts regulations. Finally, VOCs would continue to be released into the air and present risks to workers on-site.

This alternative would be the least protective of all the management of migration alternatives because it would not reduce current risks to workers from inhalation of airborne contaminants volatilized from groundwater and future risks to human health and the environment if contaminants in groundwater migrated off-site at unacceptable levels.

**ESTIMATED TIME FOR IMPLEMENTATION: < 1 YEAR**
**ESTIMATED CAPITAL COSTS: $78,000**
**ESTIMATED OPERATION & MAINTENANCE COSTS: $889,000**
**ESTIMATED TOTAL PRESENT WORTH: $967,000**

### MM-2
### Air Stripping

This alternative is a component of the overall management of migration alternative for the Site. Refer to Section X, for a discussion of this alternative.

**ESTIMATED TIME FOR OPERATION: 10 YEARS**
**ESTIMATED CAPITAL COSTS: $1,018,000**
**ESTIMATED OPERATION & MAINTENANCE COSTS: $1,483,000**
**ESTIMATED TOTAL PRESENT WORTH: $2,501,000**

### MM-3
### Carbon Adsorption

In this alternative, groundwater would be collected and extracted in the same manner as the selected remedy. The difference between this and the selected remedy is the method of treating the contaminated groundwater. For this alternative, contaminated groundwater would be pumped from the collection system to a granular activated carbon adsorption (GAC) unit. As water passes through the GAC, the contaminants would adsorb, or attach, to the surface of the carbon granules. A series of carbon filtration beds would be used to most effectively remove groundwater contaminants. The first bed would be designed to capture PCBs, predominantly, while the second bed would capture remaining VOCs. The PCB-contaminated carbon would be incinerated off-site at a federally-approved facility or regenerated off-site. VOC-contaminated carbon beds would be regenerated off-site for reuse. The treated groundwater would be disposed of on-site in the groundwater recharge area. As in the preferred alternative, treatability studies or pilot studies would be done to determine the need for pre- or post-treatment units, including acidification and precipitation/filtration.

Carbon adsorption would permanently and significantly reduce contaminant levels in groundwater and would attain ARARs. Carbon treatment would significantly reduce contaminant mobility and toxicity in extracted groundwater. This treatment would be readily implementable and effective in reducing contaminant levels to groundwater target levels. However, this alternative would require long-term management of waste residuals, including metal sludges and spent carbon. As with MM-1, MM-2 and MM-4, institutional controls including deed restrictions would be instituted to restrict

**the use of on-site groundwater containing particulate-bound PCBs for drinking water sources. Coupled with institutional controls, this alternative would provide overall protection of human health and the environment.**

**ESTIMATED TIME FOR OPERATION: 10 YEARS**
**ESTIMATED CAPITAL COSTS: $934,000**
**ESTIMATED OPERATION & MAINTENANCE COSTS: $1,392,000**
**ESTIMATED TOTAL PRESENT WORTH: $2,326,000**

### MM-4
### Ultraviolet (UV) Oxidation

**As with MM-3, this alternative is the same as the preferred alternative, except for the method of treating the contaminated groundwater. UV/Oxidation is an innovative technology that would treat organics in contaminated groundwater. Following pretreatment, groundwater would be treated with an oxidizing agent, such as ozone or hydrogen peroxide, while being exposed to UV light. UV light reacts with the oxidizing agents to form chemical oxidants that react with the organic contaminants in the water, increasing the rate at which organic compounds, such as PCBs and VOCs, are broken down.** If these chemical reactions are carried to completion, the end products of the oxidation process are carbon dioxide and water. Treated waters would be disposed of in the on-site recharge field. Because UV/Oxidation is an innovative technology, pilot testing would be required to determine its effectiveness at the Norwood PCB Site and the need for pre- and post-treatment units, such as acidification and precipitation/filtration.

UV/Oxidation is a relatively new technology that has been proven effective in treating hazardous wastes containing VOCs and PCBs. This technology would permanently and significantly reduce contaminant levels to groundwater target levels and would comply with ARARs. It would also significantly reduce contaminant mobility and toxicity in extracted groundwater.

This alternative may require long-term management of waste residuals, including metal hydroxide sludges. Limited availability of vendors is also a potential implementability drawback. As with MM-1, MM-2 and MM-3, institutional controls would be implemented to restrict the use of on-site groundwater containing particulate-bound PCBs for drinking water sources and provide overall protection of human health and the environment.

ESTIMATED TIME FOR OPERATION: 10 YEARS
ESTIMATED CAPITAL COSTS: $1,047,000
ESTIMATED OPERATION AND MAINTENANCE COSTS: $1,807,000

**ESTIMATED TOTAL PRESENT WORTH: $2,854,000**

## X. THE SELECTED REMEDY

**The selected remedy for the Norwood PCB Site is a comprehensive approach for overall site remediation which involves combining source control alternatives (SC-3, SC-B) and a management of migration alternative (MM-2). This comprehensive approach is necessary in order to achieve all the response objectives established for site remediation and to meet legal requirements.**

### A. Description of the Selected Remedy

### 1. Remedial Action Objectives/Cleanup Levels

The selected remedy was developed to satisfy remedial objectives which will guide the design of the remedy and be used to measure the success of the remedy. Site-specific remedial objectives and cleanup levels for each media are presented below:

#### a. Soil Cleanup Levels

The objectives of the soil component of the selected remedy are to reduce risks posed by direct contact with and incidental ingestion of soils contaminated with PCBs and PAHs and to minimize migration of VOCs to groundwater.

To achieve these remedial objectives, EPA has used a risk assessment methodology to establish soil cleanup levels for several different situations at the Site. The risk assessment methodology used in establishing risk-based target levels was based primarily on Region I's "Supplemental Risk Assessment Guidance for the Superfund Program." EPA recognizes the inherent uncertainties in establishing such health-based soil cleanup levels. Uncertainties are associated with the value of each exposure parameter, the toxicological data base and the overall set of exposure assumptions. Despite these uncertainties, EPA believes that the assumptions used to estimate the cleanup levels in the Endangerment Assessment prepared for this Site are reasonable and that the cleanup goals established in this remedy will be adequately protective of human health and the environment.

During the excavation and treatment of soil, air quality will be monitored to ensure that site-specific ambient action levels are not exceeded.

1. Soils on Grant Gear and Adjacent Commercial Properties

**For soils within the Grant Gear property and surrounding properties, soil target cleanup levels are established at 10 ppm of total PCBs and 6 ppm of total carcinogenic PAHs. Soils outside the Grant Gear property that are covered with pavement will be remediated only where the covered soils contain PCB levels greater than 25 ppm.**

**Potential exposure and risks were assessed for workers, through dermal contact with and incidental ingestion of chemicals of potential concern in surficial soils at commercial properties within the site boundaries. The maximum incremental carcinogenic risk for a worker in the vicinity of the Grant Gear facility, coming in contact (landscaping, storing) with contaminated surficial soils was $8x10^{-3}$. Total PCBs and total carcinogenic PAHs contribute the majority of the total risk. Based on the results of the site-specific risk assessment for the protection of workers of Grant Gear and adjacent commercial properties, soil cleanup levels of 10 ppm of total PCBs and 6 ppm of total carcinogenic PAHs have been selected. The assumptions used to calculate these soil target levels are presented in Table 14, and reflect the current and future manufacturing land use of this area.**

Reducing the concentrations of residual contaminants to these levels will result in an incremental carcinogenic lifetime risk level of $1x10^{-5}$ under both current and future use site conditions. In addition, placement of 10 inches of a clean soil cover over treated soils will further reduce potential risks associated with direct contact with and incidental ingestion of contaminated soils. As specified in the TSCA PCB Spill Policy, placement of a 10 inch soil cover would reduce risks associated with contact with contaminated soils by a factor of 10. Therefore in accordance with this policy, the combination of treatment of contaminated solids to the target level described above and placement of a 10 inch soil cover will result in an incremental carcinogenic lifetime risk level to workers of $1x10^{-6}$ under both current and future manufacturing use of this area.

Soils outside the Grant Gear property that are covered with pavement will be remediated only where the covered soils contain PCB levels greater than 25 ppm. The existing pavement already contains the contamination and prevents risks from exposures from direct contact or ingestion. Based on results of the RI, PCB levels under paved areas outside of the Grant Gear property did not exceed these levels. Therefore, no paved areas are expected to need remediation. The PCB criteria of 25 ppm for paved areas is consistent with EPA's TSCA PCB Spill Cleanup Policy.

This soil component of the selected remedy will also reduce

VOC levels in the unsaturated soils which at present are migrating into the groundwater at levels that contaminate the groundwater above groundwater quality and drinking water standards. The site-specific analysis for determining target soil cleanup levels for VOCs used fate and transport modeling to determine levels at which residual VOCs in soils would not leach contaminants to groundwater in levels above the groundwater target cleanup levels. Reducing VOCs to the soil target cleanup levels will reduce the time needed for restoration of the aquifer and aid in the attainment of groundwater target levels, including MCLs. Of the contaminants found in the unsaturated soils, the following have established groundwater target levels, as identified in Section X.A.1.b.

| | |
|---|---|
| • trichloroethene | 5 ppb |
| • tetrachloroethene | 5 ppb |
| • vinyl chloride | 2 ppb |
| • 1,2,4-trichlorobenzene | 350 ppb |
| • 1,4-dichlorobenzene | 5 ppb |

For soils within the Grant Gear property, the following soil cleanup target levels have been established based on above levels and the leaching model:

| | |
|---|---|
| • trichloroethene | 24 ug/kg |
| • tetrachloroethene | 60 ug/kg |
| • vinyl chloride | 5 ug/kg |
| • 1,2,4-trichlorobenzene | 97 mg/kg |
| • 1,4-dichlorobenzene | 260 ug/kg |

### 2. Soils and Dredge Piles Between Grant Gear's Northern Fence and Meadow Brook, and Residential Properties North of Meadow Brook

Target soil cleanup levels of 1 ppm of total PCBs and 2 ppm of total carcinogenic PAHs are established for soils and dredge piles between Grant Gear's northern fence and Meadow Brook, and for soils in the yards of residences adjacent to the north bank of Meadow Brook. Since no federal or state ARARs exist for contaminants in the soil, the soil target levels for PCBs and PAHs were determined by a site-specific risk analysis. The EA estimates that a child exposed to maximum concentrations of contaminants in dredge piles or soils in the wooded area north of Grant Gear faces an excess incremental carcinogenic risk of $6 \times 10^{-4}$. In addition, an assessment of the risk posed to residents by maximum low level contamination detected in the soils in the backyards of residences on the north side of Meadow Brook estimated an excess incremental carcinogenic risk of $3 \times 10^{-6}$. PCBs and total carcinogenic PAHs contribute the majority of the total risk.

In order to reduce the risks posed by current site conditions to levels protective of residents exposed to contaminated soils in the aforementioned areas, soil and dredge pile cleanup levels of 1 ppm of total PCBs and 2 ppm of total carcinogenic PAHs have been selected. The assumptions used to calculate these soil target levels are presented in Table 14, and reflect the nonrestricted access and residential current and future land use of the areas along and adjacent to Meadow Brook. These clean-up levels will result in an incremental carcinogenic lifetime risk level of $7 \times 10^{-6}$ under both current and future use site conditions.

In addition to setting levels protective of human health, the soil PCB cleanup level of 1 ppm was selected to be consistent with the Meadow Brook sediment PCB cleanup level of 1 ppm. This consistency will ensure that after the stream remediation, the streambed sediments will not be recontaminated with PCBs due to contaminants in soil eroding into the stream from areas adjacent to Meadow Brook.

EPA has determined that for this Site, only contaminated unsaturated soils will be excavated and treated. This determination is made primarily on the basis of three criteria: implementability, effectiveness and cost. Specifically, excavation of saturated soils would require dewatering in areas to be excavated. As discussed in Chapter 7 of the FS in the discussion of the active groundwater extraction system, the design of any active dewatering operation would require special measures to prevent the drawing of Meadow Brook surface waters into the extraction system. A slurry wall, commonly used in such cases, would present long-term impacts by continuing to restrict groundwater flow in and around its location for periods after implementation of the dewatering operation. Secondly, areas to be excavated in the saturated zone would include areas immediately adjacent to the Grant Gear building. Disadvantages associated with extensive excavation of soils in and around the building include possible structural damage to the building and the exterior drainage system. Because results of the RI indicated that the weathered bedrock may also be contaminated, the effectiveness of this excavation will be limited by the ability to locate and remove all contaminated weathered bedrock as well as all saturated soils. It is of significance that any residual PCB levels in bedrock or saturated soils not removed during implementation of this remedial action may contribute to PCB levels in groundwater above a human health-based risk level.

As stated above, removal and treatment of all saturated

**soils and bedrock, above the health-based target level, even if feasible, may not ensure levels in groundwater protective of human health. Additionally, major disadvantages are associated with the implementability of this alternative. Therefore, based on the description above, EPA has determined that it is impracticable to remediate contaminated saturated soils at this Site. However, all unsaturated soils with contaminant levels greater than soil target cleanup levels, as described in this section, will be remediated.**

### b. Groundwater Cleanup Levels

**The purposes of the groundwater component of the selected remedy are to reduce within a reasonable time frame risks to workers posed by inhalation of airborne contaminants volatilized from groundwater and to reduce risks to human health and the environment from current and future migration of contaminants in groundwater.**

**The groundwater cleanup levels established for this remedy are** the Maximum Contaminant Levels (MCLs) and the Massachusetts groundwater quality standards for contaminants in groundwater at the Site. The determination of groundwater cleanup levels focused on the risks posed by current levels of contamination at the Site, the classification of the groundwater underlying the Site and compliance with federal and state ARARs. Groundwater on-site represents a potential future drinking water source according to state and federal classifications. The EA prepared for this Site estimated that the total incremental carcinogenic risk if a person were to drink the on-site groundwater containing contaminants of concern at the mean and maximum concentrations for a lifetime was estimated at $1x10^{-3}$ and $4x10^{-2}$, respectively. Vinyl chloride and PCBs contributed over 99 percent of the total carcinogenic risk.

EPA considered as ARARs several standards in establishing the groundwater cleanup levels. These include Maximum Contaminant Levels (MCLs) for several groundwater contaminants that have been established as federal and state drinking water standards and Massachusetts groundwater quality standards. Health effects assessments were also considered in establishing cleanup levels. The following contaminants and their respective groundwater cleanup levels have been established for the Norwood PCB Site:

| | | |
|---|---|---|
| • | trichloroethene | 5 ppb |
| • | tetrachloroethene | 5 ppb |
| • | vinyl chloride | 2 ppb |
| • | 1,2,4-trichlorobenzene | 350 ppb |
| • | total 1,2-dichloroethenes | 175 ppb |

- **1,4-dichlorobenzene 5 ppb**

**Of the compounds listed above, the cleanup levels set for 1,2,4-trichlorobenzene and total 1,2-dichloroethenes were based on the site-specific health assessment for the protection of human health from adverse noncarcinogenic effects due to ingestion of groundwater contaminated with those chemicals. Groundwater cleanup levels for trichloroethene, tetrachloroethene, vinyl chloride and 1,4-dichlorobenzene were set to attain Massachusetts groundwater quality standards. Of those four chemicals, the groundwater cleanup levels specified for vinyl chloride and trichloroethene were also based on MCLs established under the federal Safe Drinking Water Act (SDWA) and as Massachusetts drinking water standards and groundwater standards. Attainment of these levels in groundwater at the Site will reduce the current and future risks to human health from inhalation of airborne VOC contaminants to an estimated lifetime carcinogenic lifetime risk of $5x10^{-6}$ and will significantly reduce future risks to human health from ingestion of contaminants in groundwater.**

Groundwater remedial objectives include attaining the groundwater target cleanup levels within a reasonable time frame. Chapter 6 of the FS presents the times estimated for the most upgradient groundwater contamination to travel and be extracted in the groundwater collection system, assuming no further chemical leaching occurs from soils in the unsaturated zone. Based on this FS analysis, EPA estimated that the groundwater at the site will attain the cleanup levels in 10 to 11.5 years, if the groundwater is remediated as described in components (e) and (f) of the selected remedy.

Neither MCLs nor Massachusetts groundwater standards have been established for PCBs that have been detected in the groundwater at the Site and are assumed to be adsorbed onto soil particulates in the saturated soils. Currently no drinking water or groundwater standards for PCBs are in effect, although EPA has proposed an MCL for PCBs at 0.5 ppb. While the soil and groundwater components of the selected remedy will reduce PCB levels in soils and collect PCBs in contaminated groundwater, PCBs in the saturated soils will not be remediated in a source control action, (see Section X.A.2.b.i.). The Agency believes that due to the continued presence of PCBs in the saturated soils it is technically infeasible to collect enough particulate-bound PCBs in the saturated zone as part of a groundwater remedy to significantly reduce PCB levels in groundwater to a health-based groundwater cleanup level or to the levels of the proposed MCL. Based on a comparison of PCB levels detected in unfiltered groundwater samples and in filtered groundwater samples, EPA has concluded that the majority of PCBs detected in on-site groundwater are not dissolved but bound to soil particulates. In the case of PCBs present on particulates, the rate of removal through groundwater extraction is very limited and substantial amounts of clean water would be affected as it is pulled into the contaminated zone. The FS estimates that the time to remediate PCBs in the groundwater of the site, under the groundwater collection and treatment systems described in selected remedy, is over 1,000 years. Therefore, in order to ensure protection of human health, the selected remedy will incorporate the implementation of institutional controls to prohibit the use of on-site PCB-contaminated groundwater for drinking water sources.

### c. Sediment Cleanup Level

The objective of the sediment component of the selected remedy is to reduce risk to human health and the environment associated with direct contact with and incidental ingestion of Meadow Brook sediments.

The cleanup level for sediments in the stream bed of Meadow Brook is 1 ppm of total PCBs. The Endangerment Assessment identified excessive risks associated with exposure to contaminated sediments in Meadow Brook including direct contact with or incidental ingestion of sediments for a child. The highest incremental ingestion carcinogenic risk was $5x10^{-5}$, based on direct contact by an older child with the maximum concentrations of contaminants in Meadow Brook. The EA also evaluated potential impacts to environmental receptors exposed to contaminated sediments and concluded that mammals, rodents and aquatic organisms that inhabit the Meadow Brook area, are at risk from exposure to site contaminants through the skin, by ingestion or through the food chain.

The sediment cleanup level for total PCBs has been specified at 1 ppm. This value is based on toxicological literature which documents examples of sublethal toxic effects in aquatic organisms at PCB tissue levels of 1 ppm. Assuming that PCB concentrations detected in sediments would result in the same concentrations in tissues of aquatic organisms, then PCB concentrations greater than 1 ppm in sediments may result in adverse effects to aquatic organisms. In addition, achievement of the sediment cleanup level will result in a significant reduction of risk to children exposed to PCB-contaminated sediments in Meadow Brook from a maximum of $3x10^{-5}$ to $1.5x10^{-7}$.

Remediation of Meadow Brook sediments to the PCB sediment target level will further reduce the levels of carcinogenic

PAHs in the sediments and minimize the risk to children and environmental receptors exposed to PAH-contaminated sediments through direct contact and ingestion.

### d. Grant Gear Drainage System Discharge Cleanup Levels

The cleanup level for PCBs in the effluent discharging to Meadow Brook is 0.5 ppb. Achievement of this cleanup level is necessary to minimize the continued release of hazardous substances to Meadow Brook. This value is based on a practical detection limit for the analysis of PCBs and was specified in Grant Gear's draft National Pollutant Discharge Elimination System (NPDES) permit proposed in 1988. While other hazardous substances have been detected in the effluent discharged from the Grant Gear building, this remedy is establishing cleanup goals in the drainage system only for PCBs. Effluent limits for all other hazardous substances in the Grant Gear discharge system will be consistent with standards established in a final NPDES permit. EPA anticipates discharge cleanup limits will incorporate federal ambient water quality criteria and/or practical detection limits.

### e. Grant Gear Machinery/Equipment and Floor Surfaces Cleanup Level

The objectives of the machinery/equipment and floor surfaces remediation are to reduce risks to workers associated with direct contact with PCB-contaminated surfaces and to reduce risks to workers associated with inhalation of airborne PCBs within the Grant Gear building.

The cleanup levels for machinery and equipment in the plant areas of the Grant Gear building is 5 ug/100cm$^2$ for total PCBs. As described in the EA, Grant Gear worker exposure to mean and maximum PCB concentrations detected on equipment surfaces resulted in an incremental carcinogenic risk of 2x10$^{-5}$ and 5x10$^{-5}$, respectively. Based on the site-specific risk assessment, the cleanup level for Grant Gear machinery and equipment surfaces has been set at 5 ug/100cm$^2$ for total PCBs. Remediation of all equipment to this cleanup level will result in a maximum risk of 1x10$^{-5}$ workers due to exposure to contaminated machinery and equipment surfaces inside Grant Gear.

For remediation of floor surfaces, EPA has established a performance-based PCB target cleanup goal of 10 ug/100cm$^2$. Remediation of all floor surfaces to this cleanup level will reduce long-term risks to workers from exposure to contaminated surfaces and the risks to workers associated with inhalation of airborne PCBs.

## 2. Description of Remedial Components

After evaluating all of the feasible alternatives, EPA is selecting a nine-component plan to address soil, sediment, equipment and groundwater contamination at the Norwood PCB Site:

### a. Site Preparation

The site preparation work includes the establishment of security and controlled access to the Site. A chain link fence will be constructed around the perimeter of the Site and designated off-site areas. To the maximum extent feasible, the existing fences will be utilized.

Site preparation work will also include provisions for controlling site drainage. In general, based on a conceptual design described in the Feasibility Study, diversion ditches will be used to ensure proper drainage of stormwater away from the Site. Erosion control in the form of silt fencing will be used to prevent uncontrolled movement of contaminated soils. Stormwater management and erosion control measures to be used during excavation/treatment activities are also considered part of the site preparation work.

Because these activities may include soil movement, an air monitoring program will be implemented during the performance of the site preparation work to determine risks to on-site workers and nearby residents. In addition, subsequent to site preparation work but prior to soil excavation activities, soil monitoring will be performed to further define soil contaminant levels in any area impacted by site preparation work.

This component of the remedy will utilize measures to limit potential air emissions from excavation activities, including the following methods: enclosure of the work areas; emission suppression techniques (i.e., foam, water spray); and containment of excavated soils. In addition, best management practices and engineering measures, such as installation of curbing and sweeping of pavement surfaces, will be taken to prevent further contamination of Grant Gear's drainage system including roof surfaces.

To the extent legally required, any soils that will be excavated as a result of any site preparation work will be adequately stored on-site in accordance with state and federal regulations (e.g., TSCA, 40 CFR § 761.65) prior to treatment on-site during implementation of the soil treatment component of the selected remedy.

**Following the installation of erosion control structures, clearing and grubbing will be performed on the densely vegetated parts of the Site. Cleared debris such as trees and shrubs will be disposed of off-site after initial processing (i.e., chipping) or if appropriate, burned on-site. EPA anticipates that decontamination of such debris will not be required. In order to minimize the possibility of residual contamination of debris, special precautions will be taken during clearing and grubbing activities such as temporary covering of contaminated soils. Any rubble for fill material unearthed during site preparation work or surface obstructions (e.g., cinder block, metal scrap) will be decontaminated prior to off-site disposal in an approved facility. After areas have been cleared, grading will be performed to provide a level surface for the operational areas.**

**A concrete pad for stockpiling and dewatering will be constructed as the final step to prepare for construction of the soil and sediment treatment facility. Storage facilities will be designed in accordance with storage requirements under TSCA of 40 C.F.R. § 761.65.** Specifically, the facilities will meet, at a minimum, the following criteria:

1) Adequate roof and walls to prevent rain water from reaching stored materials;
2) Adequate floor with continuous curbing; and
3) No openings that would permit liquids to flow from curbed area.

### b. Excavation, Treatment and On-Site Disposal of Soils and Dredge Pile Materials

This component is composed of the following: excavation, grading, solvent extraction, on-site disposal, backfilling, soil covering, predesign work and implementation monitoring.

#### i. Excavation.

To implement this component, a processing area will be set up at the Site prior to soil excavation. The processing area will be constructed so as to prevent, to the extent possible, any migration of the excavated soils.

All unsaturated soils and dredge pile materials contaminated above the soil cleanup levels, described in Section X.A.1.a, will be excavated (see Figure 6-1 FS), which is approximately 31,000 cubic yards, including soils within the 100-year floodplain. Areas to be excavated would be primarily within the Grant Gear property and immediately south and north of Meadow Brook.

In the areas within the Grant Gear property and adjacent commercial properties all unsaturated soils and dredge pile materials contaminated with PCBs greater than 10 ppm, or with carcinogenic PAHs greater than 6 ppm, or with organic chemicals above the soil target cleanup levels, approximately 28,500 cy, will be excavated and treated using a solvent extraction technology. The exact volume of soils and dredge pile materials to be treated and/or excavated will be further defined by predesign sampling. Soils and dredge pile materials from areas immediately south and north of Meadow Brook including the backyards of residents, with total carcinogenic PAH concentrations above 2 ppm and total PCB concentrations above 1 ppm and 10 ppm will be excavated. These soils with levels less than 10 ppm PCB or less than 6 ppm PAH will not be treated, but will be used as fill in the areas within the Grant Gear property where contaminated soils were excavated. A summary outlining soil action and target levels is given in Table 15.

As described in component (a) of the selected remedy, measures will be implemented to limit potential air emissions from excavation, treatment and ancillary activities. In addition, best management practices and engineering measures, such as installation of curbing (berms) and sweeping of pavement surfaces, will be taken during soil excavation, treatment storage and disposal activities to prevent further contamination of Grant Gear's drainage system including roof surfaces.

Appropriate pretreatment and materials handling (blending), such as feed size preparation and optimum soil feed criteria, will be evaluated during remedial design for the soil excavation phase of the selected remedy.

ii. Treatment by the Solvent Extraction Process.

The solvent extraction process involves the use of a solvent to remove PCBs and other organic chemicals from the soils. The first step in this process is to mix the contaminated soils with water and the solvent in order to extract the PCBs and other organic chemicals from the soils. Once the extraction is complete, the treated soils are removed from the mixture. Soils that do not meet EPA's target cleanup goals after an initial extraction will again be treated in the solvent extraction process until the target levels are attained. The liquid solvent/PCB/water mixture is then heated, separating the solvent/PCB-contaminated oils from the PCB-free water. The solvent is then separated in a stripping column and recycled for use in the system. The solvent extraction process will take place in a closed unit to prevent any contaminant air emissions.

**Design of facilities and best management practices related to the storage and use of solvent and other chemical products and waste will be performed in accordance with state and federal regulations, including Massachusetts Hazardous Waste regulations and requirements for above-ground storage tanks. Extracted PCBs and other organic chemicals will be collected, stored and disposed of off-site by incineration in accordance with TSCA regulations at 40 CFR Part 761. Residual water from the process will be pumped into storage tanks for treatment by a portable carbon unit located on-site or for storage until the on-site groundwater treatment system is implemented.**

**iii. On-site Disposal.**

**All excavated areas within the Grant Gear property and surrounding businesses will be backfilled with soils and sediments treated to the soil cleanup levels and the untreated soils and sediments from the Meadow Brook area with contaminant levels below 10 ppm PCBs or 6 ppm PAHs or clean fill. All areas where treated soils will be disposed will be covered with 10 inches of topsoil and either revegetated or repaved and returned to their original condition, to the extent practicable. Excavated areas immediately south and north of Meadow Brook will not be filled with treated soils. These areas will be backfilled with clean fill brought in from off-site, layered with topsoil, and revegetated.**

iv. Remedial Design.

Predesign work will include soil sampling, defining the unsaturated zone and solvent extraction treatability studies. Areas to be sampled are shown in Figure 7. The sampling will further define soil contamination above soil target levels in the unsaturated layer in the above referenced areas. The unsaturated zone at the Site is defined as that area from the surface elevation to the seasonal low groundwater table. The seasonal low groundwater elevation will be defined by implementing a monitoring program that will evaluate the fluctuation of the water table. This program will include the use of continuous recorders to monitor the water level fluctuations, with particular focus on periods of seasonal low water.

Solvent extraction is an innovative treatment. Prior to implementation of the full-scale process at the Site, predesign treatability studies, including a pilot study, will be conducted to determine the implementability of this technology on site-specific contaminants and on a full-scale level. The pilot study will yield information on optimum operational settings, percent reduction of organic compounds in soils and sediments and the volumes and types of residuals and byproducts produced by the operation of the treatment system. Results of the treatability and pilot studies will also be evaluated to determine appropriate material handling methods that will be implemented during remedial action. This evaluation will determine the extent to which soils will be blended prior to treatment, based on soil characteristics and/or contaminant levels, to ensure the optimal effectiveness of the solvent extraction process in reducing site contaminants to respective target levels. Appropriate materials handling measures is particularly critical for this Site because of the relatively high levels of contaminants detected in soils in some areas.

If solvent extraction, based on the results of the treatability studies, is not determined to be implementable or effective or is determined to be significantly more costly than incineration, on-site incineration will be used as the treatment technology for the removal of site contaminants in soils, dredge pile materials and sediments. On-site incineration was discussed and evaluated in the FS and the Proposed Plan as SC-5. Incineration is a proven technology at Superfund sites to treat wastes similar to those found at the Site. Prior to full-scale implementation, a trial burn will be conducted to demonstrate that the incineration technology can achieve a 99.9999 percent destruction and removal efficiency for PCBs. Residuals and side streams will also be evaluated during the trial burn. Treated soils will be placed back on-site, covered with 10 inches of clean soil and revegetated. All other components of the source control remedy would remain the same.

v. Monitoring.

An air monitoring program will be implemented during the performance of the on-site soil excavation and treatment component of the remedy to determine risks to on-site workers and nearby residents. Air sampling stations will be located at representative points throughout the Site and at the perimeter of the Site. Samples will be analyzed, at a minimum, for VOCs, PCB in vapor phase and PCB particulates.

vi. Additional.

EPA anticipates that some amount of on-site wetlands areas will be impacted by soil excavation. For those areas, steps will be taken, as described in component (g) of the selected remedy, to minimize potential destruction or loss of wetlands or adverse impacts to organisms.

**Upon completion of the excavation of on-site contaminated soils and dredge pile materials, samples will be collected and contaminant levels will be evaluated against the cleanup levels for soils (see Section X.A.1.a). Additionally, sampling and analysis of soils entering and leaving the full-scale treatment plant will be evaluated. All samples will be evaluated to ensure that response objectives are achieved.**

**A summary of this soil component is given in Table 15.**

### c. Excavation, Treatment and On-Site Disposal of Sediments

**The sediment component is composed of: preparation work, temporary diversion of surface waters, excavation/dredging, implementation monitoring, rediversion of surface waters, dewatering, storage, and on-site disposal.**

Initial preparation work, as described in component (a) of the selected remedy, will include clearing of trees and shrubs only from those areas necessary for implementation and construction of this component. Cleared materials will be disposed of off-site, or if appropriate, burned on-site. Additional requirements relating to dust suppression techniques during sediment excavation, transport and disposal and decontamination procedures for rubble material will be implemented as described in site preparation, component (a) of the selected remedy.

Meadow Brook streambed sediments with contaminants in excess of the sediment target cleanup level of 1 ppm PCBs will be excavated. Initially, the stream sediments will be excavated to a depth of two feet, from locations near the Grant Gear outfall to the confluence of Meadow Brook and the Neponset River. The FS estimated that approximately 3,000 cy of sediments are at PCB levels greater than 1 ppm. Additional sediment excavation will be conducted as necessary to remove all sediments at levels exceeding 1 ppm PCBs.

EPA will determine when excavation activities should be performed by evaluating weather conditions, stream flow, scheduling constraints and the impacts of construction activities on the proposed Meadow Brook flood control project.

This portion of the selected remedy will be implemented in a manner that mitigates any contaminant migration downstream. To accomplish the brook excavation, a temporary dam will be constructed upstream to expose the stream sediments. The method of stream diversion will be determined during design of the selected remedy, considering the need to mitigate wetland impacts. If feasible, the stream flow will be diverted and/or pumped through a temporary pipe located parallel and in close proximity to the existing streambed to carry brook surface waters around the areas to be excavated.

Because the streambed and adjacent areas are wetlands, sediment excavation and associated activities will be performed to minimize adverse impacts to wetland areas. EPA has determined that, for this Site, there are no practicable alternatives to the soil excavation, sediment excavation and stream diversion components of the selected remedy that would achieve site goals but would have less adverse impacts on the aquatic ecosystem. Sedimentation basins and/or silt curtains will be installed downstream to capture any particles that may become suspended during excavation activities. During excavation and dewatering of PCB-contaminated sediments, downstream monitoring of surface water will be conducted to ensure that transport is not occurring as a result of the excavation. For wetlands areas affected by sediment excavation, steps will be taken as described in component (g) of the selected remedy, to minimize potential destruction or loss of wetlands or adverse impacts to organisms.

The exposed sediments will then be excavated and moved to the stockpile/dewatering pad on-site. Dewatered sediments with PCB concentrations greater than 10 ppm or carcinogenic PAH concentrations greater than 6 ppm will be treated by solvent extraction to the 10 ppm PCBs and 6 ppm PAHs target levels and disposed of on-site, as described for soils and dredge pile materials in component (b) of the selected remedy. Sediments with PCB concentrations less than 10 ppm or carcinogenic PAH concentrations less than 6 ppm will not be treated prior to disposal on-site in excavated areas along with treated soils and sediments.

An air monitoring program will be performed during the implementation of this component to monitor risks to on-site workers and nearby residents, as described in component (a) and (b)(v) of the selected remedy.

After the initial excavation of sediments, sediment sampling of the excavated areas will be performed to ensure compliance with the sediment target level. Sediment samples will be analyzed, at a minimum, for PCBs and TOC. These samples will be used to evaluate the success of excavation/dredging. Based on the sampling results, additional excavation at one foot depth intervals will be performed in any area where sediment contaminant levels are equal to or greater than the sediment target level.

### d. Flushing Cleaning and/or Containment and Replacement of Portions of Grant Gear Drainage System, Cleaning and Sealing of Roof Surfaces, Decontamination of Machinery/Equipment and Floor Surfaces

#### i. Flushing/cleaning and/or Containment and Replacement of Portions of Grant Gear Drainage System, and Cleaning and Sealing of Roof Surfaces

**This component includes flushing and cleaning the drainage system's piping and manholes to remove as much of the contaminated sediments as possible and minimize any further migration of contaminants from the drainage system into Meadow Brook. The first step of this component will be to purge the drainage system of all solids, using standard pipe cleaning methods (i.e., pneumatic ball or "pig" and wire brushes). All purged sludges and solids, including sediments from manholes, will be collected for subsequent treatment as specified in component (b) of the selected remedy.** Sediments with contaminant levels too high to be effectively treated on-site to less than 10 ppm PCBs and 6 ppm carcinogenic PAHs or all sediments if the storage time before treatment would be excessive, will be transported off-site to an incinerator operating in compliance with 40 CFR Part 761. Costs estimated for this component assumed that the sediments would be treated on-site.

The mechanical purging and collection operations will be followed by flushing of the drainage system using water to drive out as much contamination as possible. Flushing operations will include methods to prevent the release of hazardous substances to Meadow Brook, including sedimentation basins.

The extent to which flushing and cleaning can eliminate contaminants within the existing drainage system and thereby permit its continued use in the long-term, will be determined during remedial design. However, it is anticipated that major portions of the external drainage system to the west and north of the Grant Gear building cannot be effectively flushed. Where the remedial design studies or remedial action show that flushing will be ineffective, for those portions, the drainage system will be abandoned and contained with concrete or a slurry mixture (e.g., bentonite/soil slurry). Containment of the drainage system was discussed and evaluated as part of alternative SC-C. Any portion of the existing drainage system that will be abandoned and/or contained will be replaced by new piping or manholes, to the extent necessary to control stormwater discharge from the facility. Containment will be an effective method of preventing any further discharge of contaminants in the drainage system into the environment or

Meadow Brook. The determination of whether to use concrete or a slurry mixture will be made during the remedial design, considering factors such as cost, implementability, permanence, and effectiveness. All other aspects of this component of the selected remedy would remain the same.

This component of the selected remedy includes additional sampling of roof materials on the high and low roofs and stormwater collected in roof drains to further define the extent of PCB contamination for these building structures. If additional sampling of roof covering materials and stormwater on the roof indicates that stormwater discharging from the roof contains PCB concentrations greater than the Grant Gear drainage cleanup levels set forth in Section X.A.1.d., contaminated gravel on the roof will be removed and disposed of on-site and roof drains will be cleaned. If cleaning of the roof drains is determined to be ineffective in reducing contaminant levels in the discharge stream, the roof drains will be removed or contained and replaced depending upon the most cost-effective method. Should the actions to clean the roof and roof drain prove ineffective in reducing contaminants discharging to Meadow Brook, the roof will be sealed with a sealing agent and covered with additional clean gravel to immobilize and encapsulate any PCB contamination.

Decontamination of surfaces of machinery, equipment and floor surfaces within the plant areas of the Grant Gear building will be performed according to requirements specified in the EPA TSCA PCB Spill Cleanup Policy, 40 CFR Part 761, Subpart G. In particular, machinery/equipment and floor surfaces will be cleaned by double washing with an appropriate solvent and rinsing to designated target cleanup levels, as measured by the standard wipe tests. As stated in Section X.A.1.e., the risk-based PCB target cleanup level for the machinery/equipment surfaces has been established at 5 ug/100 $cm^2$. For remediation of the floor surfaces, EPA has established a performance-based PCB target cleanup goal of 10 ug/100 $cm^2$. Conformance to the PCB risk-based target level of 5 ug/100 $cm^2$ in the case of machinery/equipment surfaces and the performance-based target level in the case of floor surface will be verifed by postcleanup sampling, as specified under 40 C.F.R. § 761.130.

ii. Decontamination of Machinery/Equipment and Floor Surfaces

All hazardous or solid wastes generated from decontamination of surfaces will be properly stored, labeled, and treated in an off-site incinerator in accordance with the provisions of 40 C.F.R. § 761.60. Liquid wastes generated by the decontamination of equipment and floors will be analyzed to determine contaminant levels. If the on-site treatment system proposed for groundwater remediation would be effective in reducing the contaminant levels in the wastewater to the effluent limits set for groundwater discharge levels, then, depending upon timing constraints, wastewaters not regulated under TSCA may be stored on-site until implementation of the on-site groundwater treatment system. If treatment of the liquid wastewater generated from the decontamination operation is determined to be ineffective or not implementable in the on-site groundwater treatment system or if storage would be required for an excessive period of time, then the liquid wastes would be disposed of off-site in an approved facility.

### e. Collection of Groundwater from the On-Site Overburden and Bedrock Aquifers

On-site contaminated groundwater in the overburden and shallow bedrock aquifers will be collected by a barrier drain (see Figure 7-2 of the FS). The groundwater collection system will be designed to intercept contaminated groundwater both in the overburden aquifer that is moving toward Meadow Brook and in the shallow bedrock aquifer that, at the point of collection, will be discharging to the overburden aquifer. The barrier drain will be designed to collect contaminated on-site groundwater, but not draw in off-site groundwater and surface water. The major components of constructing the subsurface barrier extraction system are:

- Mobilization of equipment;
- Clearing and grubbing the wooded area along Meadow Brook where the barrier drain will be located;
- Excavating the trench, and sampling and stockpiling the soil;
- Placement of an HDPE liner along the bottom and the north face of the excavation;
- Placement of a geotextile fabric liner in the excavation;
- Placement of perforated PVC pipe and gravel backfill in the excavation;
- Installation of pump stations and construction of related piping to transport waters to the treatment area;
- Construction of an impermeable cap along the length of the barrier extraction system;
- Connection of the system to the treatment unit; and
- Disposing of the excavated soils.

Conceptually, as described in the FS, the barrier drain will be approximately 700 feet long and will be installed by excavating, from the ground surface to shallow bedrock, a 3 foot wide trench parallel to Meadow Brook. During excavation activities, this component of the remedy will include precautions to prevent airborne release of contaminants that is described in component (b) above. Excavated soils will be sampled to determine compliance with the soil cleanup levels, and contaminated soils will be addressed in accordance with Section X.A.2.b. of the selected remedy. A perforated pipe will be placed near the bottom of the trench to collect and carry groundwater to the pump stations. To collect only on-site contaminated groundwater and to prevent drawing water from Meadow Brook, an impermeable barrier composed of high density polyethylene (HDPE) will be placed on the side of the trench closest to Meadow Brook, allowing groundwater to enter the drain only from the side facing away from the brook. Following installation of the PVC pipe and HDPE lining, gravel backfill will be placed around the pipe and to the top of the trench to promote water drainage. The top of the trench will be capped with an impermeable layer in order to eliminate direct infiltration of surface run-off or precipitation into the system. The total flow to be extracted using the barrier system, based on available data in the RI, was estimated to range from 35 to 50 gallons per minute. Specifics of the barrier drain system will be defined during remedial design, consistent with the results of predesign studies.

Prior to installing the barrier drain extraction system, predesign studies will be performed to evaluate implementation issues. These studies will include pumping tests, permeability tests and groundwater sampling. Pumping tests will be performed primarily to define expected flow rates and the optimum location for the groundwater collection system. Prior to final design of the collection system, tests, including permeability tests, will be conducted to evaluate the effectiveness of the HDPE liner in preventing Meadow Brook surface waters from entering the groundwater collection system. Consideration of impacts of surrounding wetlands (i.e. dewatering, groundwater mounding) will be incorporated into the pumping and HDPE liner test designs. If the evaluation of predesign studies determines that the barrier drain collection system would not be implementable or effective, an active pumping extraction system will be used to collect overburden and shallow bedrock groundwater using a series of groundwater extraction wells. The extraction well system was discussed and evaluated in Section 7.2 of the FS, which described a series of nine shallow extraction wells in a line parallel to Meadow Brook. This analysis indicated that the extraction well system would be supplemented with a cutoff wall, such as a slurry wall, in order to control the capture of water flowing in Meadow Brook. The FS determined that the extraction well system would provide a technically equivalent method for collecting contaminated groundwater, but would be more expensive than the barrier extraction system. If this groundwater extraction technology is utilized, additional performance and design tests will be conducted as appropriate. Predesign studies for the active pumping extraction system will include an evaluation of the cutoff wall's short- and long-term impacts to groundwater by restricting flow in areas adjacent to the cutoff wall. All other aspects of this component of the selected remedy would remain the same.

A second groundwater collection system will be constructed to extract groundwater from the bedrock aquifer if studies during remedial design indicate that contaminated groundwater in the bedrock would not be addressed by the barrier or extraction systems described above. Groundwater monitoring of the overburden, shallow and deep bedrock will occur prior to final design of the groundwater collection system. Chemical concentrations and water evaluations will be monitored. If results of predesign studies and groundwater monitoring indicate that contaminated groundwater in the bedrock aquifer will not be addressed by the barrier or well extraction systems, final design of the groundwater collection system will include additional bedrock extraction wells in areas where the shallow bedrock barrier drain would not be effective. The Proposed Plan reviewed a second groundwater extraction system using approximately two extraction wells located at the northeast corner of the Site, near Route 1. Groundwater extracted from bedrock wells would be treated together with overburden groundwater in the water treatment facility constructed on-site.

Groundwater monitoring of the overburden, shallow and deep bedrock will occur during the implementation of the groundwater collection system. Chemical concentrations and water elevations will be monitored to evaluate the efficiency of the groundwater collection and treatment system. During implementation of the groundwater collection and treatment system, monitoring wells will be sampled on a quarterly schedule. As part of this monitoring program, the treatment and collection system influent and effluent concentrations and flow rates will be monitored with the objective of defining the mass of contaminants extracted over the life of the system. The specifics of this monitoring program will be defined during remedial design.

Once the groundwater monitoring indicates that the remedy has attained the groundwater cleanup target levels, as defined in Section X.A.1.b., the collection system will be shut down. A performance monitoring program will be

**implemented consistent with 310 CMR 30.660-675, including 310 CMR 30.672(4). This program will, at a minimum, consist of three years of quarterly monitoring of groundwater quality. Monitoring wells to be sampled will be identified in the overburden aquifer and deep and shallow bedrock aquifers. At a minimum, groundwater wells will be sampled that had been historically monitored during the operation of the collection system. Additional requirements of this monitoring program will be defined in the remedial design. The results of this monitoring will be reviewed by the EPA to evaluate the success of the extraction system. If the groundwater contaminant levels rise above the target cleanup levels during the three year monitoring period, groundwater extraction and treatment will continue in the affected areas until the cleanup levels are attained.**

### f. Treatment of Collected Groundwater

Contaminated groundwater collected in accordance with Section X.A.2.e. will be treated by a groundwater treatment system which includes the following treatment components: activated carbon, air stripping with vapor phase controls, and precipitation/filtration.

An activated carbon unit will be used to remove PCBs either as a pretreatment to the air stripper or as a polishing step after the air stripper. In air stripping, the contaminated groundwater will be pumped to the top of an air stripping tower where, as the water cascades down, air is forced up through the tower removing VOCs from the groundwater into the air stream. The air stream will then be passed through an activated carbon filter to remove contaminants before being released into the atmosphere. Spent activated carbon will be disposed of off-site or regenerated, whichever is less costly. Metals will be removed from groundwater using a chemical precipitation and filtration process. Lime or similar substances will be added to collected groundwater to cause metals to settle out of solution and form solids. The solids from the chemical precipitation and filtration process will then be dewatered to facilitate handling and disposed of off-site in an approved landfill which is operating in compliance with Sections 3004 and 3005 of RCRA, or, if PCB contamination is greater than 50 ppm, in compliance with 40 CFR Part 761. However, if these solids are determined to be hazardous, they will be pretreated and disposed of off-site in a RCRA/TSCA landfill. All hazardous wastes transported off-site will be done in accordance with RCRA, DOT and Massachusetts Hazardous Waste regulations. Water extracted from the solids would be remixed with the collected groundwater for further treatment.

Results of treatability studies or pilot studies will be evaluated to determine the best overall design for the air stripper and other treatment components and the need for pre- and post-treatment units, including acidification and carbon polishing unit, that may be necessary to meet all required discharge regulations. These results will also yield information on the percent reduction of organic and inorganic compounds in groundwater and the volume and types of residuals and byproducts produced by the operation of the groundwater treatment system.

Groundwater will be treated to meet state groundwater quality standards for organic and metal contaminants. The treated groundwater will be discharged into an on-site groundwater recharge system located upgradient of contaminated areas and the groundwater withdrawal system.

Monitoring of the flow rate and chemical analysis of groundwater entering and leaving the full-scale treatment plant will be evaluated during the operation of the treatment system to ensure that response objectives and effluent limitations are achieved.

The groundwater treatment system will continue to operate until groundwater monitoring shows that groundwater throughout the Site has attained the groundwater target levels as described in Section X.A.1.b.

### g. Wetlands Restoration/Enhancement

EPA has determined that, for this Site, there are no practicable alternatives to the selected remedy that would achieve site goals but would have less adverse impacts on the aquatic ecosystem. Unless soils and sediments greater than the target levels are excavated, the contaminants in the soils and sediments would continue to pose unacceptable human health and environmental risks.

Excavation of contaminated sediments and soils, diversion of the stream and any ancillary activities will result in unavoidable impacts and disturbance to wetland resource areas. Such impacts may include the destruction of vegetation and the loss of certain plant and aquatic organisms. Impacts to the fauna and flora will be mitigated as discussed below.

During implementation of the remedy, steps will be taken to minimize the destruction, loss and degradation of wetlands, including the use of sedimentation basins or silt curtains to prevent downstream transport of contaminated sediments. A wetland restoration program will be implemented upon completion of the remedial activities in wetland areas adversely impacted by remedial action and ancillary activities. In particular, the restoration program for the excavated portions of Meadow Brook will be designed to mitigate any future impacts of such activities to Meadow Brook and the surrounding wetlands areas. Measures to be used will include adequate sloping of stream banks to prevent excessive soil erosion into Meadow Brook.

However, this remedy will not restore the excavated Meadow Brook streambed to similar conditions existing prior to excavation. Comments from the Town of Norwood indicate that the Meadow Brook flood control project, which will include all portions of Meadow Brook targeted for sediment excavation, is slated for construction upon completion of the remedial action of the Meadow Brook area performed under Superfund. Therefore, upon completion of the soil and sediment excavation of the Meadow Brook from approximately the Grant Gear outfall to the Neponset River, the brook streambed and adjacent banks from these areas, will be restored, to the maximum extent feasible, in a manner consistent with the Meadow Brook flood control project plans and specifications.

Upon completion of the flood control project, any bordering wetland areas impacted by dredging, excavation and/or associated activities performed in accordance with component (c) of the selected remedy, will be restored or enhanced, to the maximum extent feasible, to similar hydrological and botanical conditions existing prior to these activities. Isolated wetlands within the Grant Gear boundaries that have low functional value, will not be recreated. Instead, to compensate for loss of these isolated wetland, enhancement of wetlands along Meadow Brook will be performed.

The restoration program will be developed during design of the selected remedy. This program will identify the factors which are key to a successful restoration of the altered wetlands. Factors may include, but not necessarily be limited to, replacing and regrading hydric soils, provisions for hydraulic control and provisions for vegetative reestablishment, including transplanting, seeding or some combination thereof. As described above, the restoration program will incorporate plans and specifications of the Meadow Brook flood control project for the Meadow Brook streambed and adjacent banks.

The restoration program will include monitoring requirements to determine the success of the restoration. Periodic maintenance (i.e., planting) may also be necessary to ensure final restoration of the designated wetland areas.

### h. Long-Term Environmental Monitoring and Five-Year Reviews

EPA has determined that it is technically impracticable to remediate saturated (below the water table) soils at the site and soils located under the Grant Gear building. Therefore, because wastes will be left untreated although contained beneath the unsaturated zone or the building, long-term environmental monitoring will include: groundwater monitoring; and sampling of on-site soils and sediments in Meadow Brook, the Neponset River and associated downstream wetland areas. Long-term monitoring will also include wipe sampling of equipment and floor surfaces within the Grant Gear building. The monitoring program will be designed for the following purposes:

a. to document the changes in contaminant concentrations over time;
b. to determine the degree to which contaminants in soil and groundwater are mobilizing on- and off-site;
c. to evaluate the success of remedial action; and
d. to help define the extent of institutional controls necessary.

The details of the on-site overburden and bedrock groundwater monitoring program will be developed during remedial design. The monitoring program will be tailored to site-specific hydrogeologic conditions and contaminants. Wells will be sampled on a routine basis to evaluate dispersion of the contaminant plume and the distribution of contaminant migration. The frequency of monitoring will be finalized during design; however, it is expected that monitoring wells will be sampled and analyzed on a quarterly basis to improve the existing data base and establish contaminant concentrations. During design, the condition and usefulness of existing wells will be checked and compared with future data needs. Additional overburden and/or bedrock monitoring wells will be installed if the remedial design indicates it is necessary in order to adequately monitor over a long-term the nature and extent of groundwater contamination. Initially, all samples will be analyzed, at a minimum, for VOCs, SVOCs, PCBs and metals.

Environmental monitoring will also include sampling of on-site soils and sediments in Meadow Brook, the Neponset River and downstream wetland areas to check the effectiveness of the containment of the on-site saturated soils and soils beneath the building and sediments in the drainage system in preventing mobility and transport of contaminants. At a minimum, sediment samples will be initially monitored for PCBs, SVOCs, and total organic carbon. Soil samples will be analyzed for VOCs, PCBs, SVOCs and total organic carbon. Wipe samples of equipment and floor surfaces within the Grant Gear building will be analyzed for PCBs.

**All monitoring data will be formally reviewed and evaluated during the operation and upon cessation of remedial action to ensure that appropriate remedial response objectives are achieved. Monitoring frequency and chemical parameters may be added or deleted based on review of monitoring data.**

**EPA will review the remedy every five years after the initiation of the remedial action to ensure that human health and the environment are being protected by the remedial action being implemented. Future remedial action, including source control measures, will be considered if the long-term environmental monitoring program determines that unacceptable risks to human health and/or the environment are posed by exposure to site contaminants.**

### i. Institutional Controls

**EPA believes that it is technically impracticable to remove all particulate-bound PCBs from soils at the Site (see** Section X.1.a.1). This assessment indicates that PCBs, whether dissolved or bound to particulates, will continue to be present in groundwater after the remediation has been completed. In addition, contaminated on-site subsurface soils within the water table and/or beneath the Grant Gear building and some sediments within the Grant Gear drainage system will be left untreated. Therefore, institutional controls will be necessary to achieve long-term protectiveness.

Institutional controls at this Site will be designed:

a. to ensure that groundwater in the zone of contamination will not be used as a drinking water source;
b. to prevent disturbance of contaminated untreated subsurface soils within the Grant Gear property, sediments within the Grant Gear drainage system and soils under pavement in areas outside Grant Gear.

EPA will work with state and local officials to enact ordinances and zoning restrictions to prevent the use of groundwater for drinking water and to place deed restrictions regulating land use at the Site. The effectiveness of the institutional controls will be re-evaluated during the 5 year reviews described above.

### B. Rationale for Selection

The rationale for choosing the selected alternative is based on an assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been

**found to be protective of human health and the environment and able to attain ARARs unless a waiver is invoked. In assessing the alternatives that meet these statutory requirements, EPA focused on the other evaluation criteria, including, short-term effectiveness, long-term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume, and cost. EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA selected the remedial approach for the Site. The rationale for selection of decontamination of equipment and floor surfaces is discussed in Section IX.A., all other remedial alternatives are discussed below.**

### 1. Source Control for Soils, Sediments and Dredge Piles

**Table 12 presents a comparative summary of the detailed analysis of the source control remedial alternatives for soils, sediments and dredge pile materials.** Of the three treatment technologies (SC-3, SC-4, SC-5), EPA has determined that solvent extraction (SC-3) followed by off-site incineration of the oil extract, and on-site incineration (SC-5) present the best balance of the criteria described in the preceding paragraph, particularly permanence. Specifically, both solvent extraction (selected technology) and on-site incineration (selected as the backup technology) meet the statutory preference for utilizing treatment technologies that significantly and permanently reduce the toxicity, volume or mobility of all hazardous substances. Although solvent extraction is an innovative treatment, the results of treatability studies performed on various soils and sediments at other Superfund sites indicates that this technology will be effective in meeting cleanup levels for soils, sediments and dredge pile materials. This determination will be confirmed by site-specific treatability studies on solvent extraction. If results of these studies indicate that solvent extraction would not be implementable or effective or is determined to be significantly more costly than incineration, then EPA will select on-site incineration as the treatment technology for the remediation of soils, sediments and dredge pile materials. Incineration is a proven technology for meeting the soil cleanup levels. Solvent extraction has been selected over on-site incineration because it is an alternate treatment, as preferred by CERCLA, and is equally effective as incineration in attaining the protective cleanup levels of this remedy but at a lower estimated present worth cost ($13.3 million for solvent extraction; $17.2 million for incineration). Both solvent extraction and on-site incineration will comply with ARARs. Finally,

**comments received during the public comment period indicate that while a limited number of the public prefers on-site incineration, the state prefers solvent extraction.**

**Of the remaining source control alternatives, limited no action (SC-1) was not selected primarily because it would not be protective of human health and the environment and would not comply with ARARs. Disadvantages associated with containment (SC-2) include the uncertainty of the long-term effectiveness of the containment system for untreated wastes and the potential for future remedial costs and risks to human health and the environment if the cap were to fail. Dechlorination (SC-3) was not selected because of the uncertainty of the availability of equipment and the questionable effectiveness of the technology in reducing PAH concentrations to the respective soil cleanup level. Most comments received from the public indicated a preference to reduce the site contaminants rather than containing then under a comment. No comments were received in support of the limited action alternative.**

### 2. Source Control of the Grant Gear Drainage System

Four alternatives for the remediation of the Grant Gear drainage system were evaluated in detail: no action (SC-A), flushing (SC-B), containment (SC-C), and removal (SC-D). Of these alternatives, EPA selected flushing and cleaning followed by limited containment as the alternative for the remediation of the Grant Gear drainage system. Of the four remedial alternatives (SC-A, SC-B, SC-C, SC-D), EPA has determined that flushing and cleaning followed by limited containment present the best balance of the 9 criteria described in Section VIII.B. This alternative was selected primarily because it permanently reduces, to the maximum extent feasible, the toxicity, mobility and volume (T,M,V) of hazardous substances in the drainage system. None of the other alternatives, individually or in combination, would achieve the same degree of reduction. Flushing/containment will also be protective of human health and the environment, will comply with ARARs (Clean Water Act) and is the most cost-effective alternative given the degree of T,M,V reduction. As with SC-1 and MM-1, no action (SC-A) was not selected because it would not be protective of the environment and would not comply with ARARs (Clean Water Act). Flushing (SC-B) alone was not selected because of the uncertain effectiveness of the technology in achieving discharge cleanup levels. Containment (SC-C) alone was not selected because this technology would not result in the reduction of toxicity and volume of hazardous substances. Disadvantages associated with the implementability of containment include the significant damage to Grant Gear's building structures and disruption of its operations as a

**result of major construction activities within and under building structures. Removal (SC-D) and off-site disposal of the drainage system is the least preferable alternative as defined by CERCLA. While removal from the Site would permanently reduce on-site contaminant levels, this alternative would simply move those contaminants to another site without treatment, and would not permanently reduce the mobility, toxicity or volume of the wastes. Further, removal is the most costly alternative while achieving no permanent T,M,V reduction. This alternative would also result in significant disruption to Grant Gear's operations and damage to building structures and its short-term effectiveness and risks would depend upon the ability to contain any releases of hazardous substances during the removal operations. Comments received from Grant Gear stated that flushing and cleaning would be an effective remedy. Other comments received from the public indicated a preference for off-site disposal of the drainage system. The state concurs with flushing and cleaning as the selected remedy.**

### 3. Management of Migration in Groundwater

Two types of groundwater collection systems were discussed and evaluated in Section 7.2 of the FS. The first collection system is the barrier drain system, as described in component (e) of the selected remedy. The second collection system is an extraction well system conceptually consisting of a series of nine shallow extraction wells supplemented with a cutoff wall to prevent inflow from Meadow Brook. A comparative evaluation of the two groundwater collection systems presented in the FS indicates that the extraction well system would provide a technically equivalent method for collection of contaminated groundwater, but would be more expensive than the barrier extraction system. Construction of a cutoff wall (e.g., slurry wall) may result in long-terms impacts to groundwater by restricting flow in areas adjacent to the cutoff wall, for the period following successful remediation of the on-site aquifers. For the reasons stated above, selection of the barrier drain groundwater collection system is the more less-costly. However, if the evaluation of predesign studies determine that the barrier drain collection system would not be implementable or effective, an active pumping system will be used to collect overburden and shallow bedrock groundwater.

Table 13 presents a comparative summary of the detailed analysis of the management of migration alternatives for groundwater. This summary indicated that all three treatment alternatives: air stripping (MM-2), carbon adsorption (MM-3), and ultraviolet/oxidation (MM-4) would

**utilize treatment to permanently and significantly reduce the T,M,V of hazardous substances, would comply with ARARs and would be effective in reducing contaminant levels to groundwater target levels. Coupled with institutional controls to restrict the use of on-site groundwater containing particulate-bound PCBs for drinking water sources, all three treatment alternatives would provide overall protection of human health and the environment. Of the three treatment technologies (MM-2, MM-3, MM-4), EPA has determined that air stripping (MM-2) presents the best balance of the 9 criteria described in Section VIII. B. Air stripping was selected as the treatment technology for the remediation of on-site groundwater because it is more implementable than UV/oxidation and its effectiveness is proven. Air stripping also will not generate, to the same extent, the amount of waste residuals (spent carbon) as carbon adsorption. As described above, MM-1 was not selected because it would not be protective of human health and the environment and would not comply with ARARs. Comments received from the PRPs questioned the justification for remediation of groundwater given the need for institutional controls. Other comments from the public indicated the preference for groundwater remediation to reduce site contaminants. The state concurs with the groundwater component of the selected remedy.**

## XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Norwood PCB Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy also satisfies the statutory preference for treatment which permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element. Additionally, the selected remedy utilizes alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

### A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will permanently reduce the risks presently posed to human health and the environment through: 1) solvent extraction of PCBs and other contaminants in soils, sediments and dredge pile materials and off-site incineration of PCB-contaminated oil extract; 2) flushing and containment of PCB-contaminated sediments in the Grant Gear drainage system to prevent further contamination of Meadow Brook; 3) decontamination of equipment and floor surfaces within the Grant Gear building; 4) extraction and

**treatment by air stripping of contaminated groundwater to contain the contaminant plume and restore groundwater quality; and 5) institutional controls.**

**Treatment of contaminated soils and dredge pile materials will reduce risks associated with exposure to contaminants from direct contact with and ingestion of soils and dredge pile materials from a maximum incremental carcinogenic risk of $8x10^{-3}$ at Grant Gear to less than $1x10^{-5}$. In addition, 10 inches of clean soil will be placed over areas where treated soils will be disposed to further reduce the potential risks associated with direct contact with or ingestion of site contaminants.**

**Excavation, treatment (if necessary) and on-site disposal of contaminated sediments will mitigate risks to environmental receptors inhabiting the Meadow Brook area and will significantly reduce risks to children exposed to contaminated Meadow Brook sediments.** The Grant Gear office and machinery equipment surfaces cleanup level to be attained by the decontamination of these surfaces, will reduce risks to Grant Gear workers in direct contact with such surfaces to a maximum carcinogenic risk of $1x10^{-5}$. Reducing the levels of floor contaminants will minimize the potential for migration of PCBs into the air, and subsequent recontamination of equipment and machinery. The combination of flushing and containment of the Grant Gear drainage system will virtually eliminate the continued release of hazardous substances to Meadow Brook, especially PCBs, so as not to recontaminate the stream sediments and reintroduce the risks from sediments that are being remediated by this remedy.

Risks from exposure to contaminated groundwater, via inhalation of groundwater contaminants in the air or ingestion, will be permanently and significantly reduced as a result of groundwater collection and treatment. Cleaning the contaminated groundwater at this Site will promote restoration of groundwater quality and prevent off-site migration of contaminated groundwater. EPA has determined that it is technically infeasible to attain a health-based groundwater cleanup level for PCBs (see Section X.A.1.b.). Groundwater within the zone of contamination is not currently used for drinking water sources. Institutional controls will be implemented to ensure that in the future, drinking water wells will not be drilled within the zone of PCB groundwater contamination.

### B. The Selected Remedy Attains ARARs

This remedy will meet or attain all applicable or relevant and appropriate federal and state requirements that apply to

**the Site. Environmental laws from which ARARs for the selected remedial action at the Norwood PCB Site are derived include:**

**Toxic Substances Control Act (TSCA)**
**Resource Conservation and Recovery Act (RCRA)**
**Clean Water Act (CWA)**
**Safe Drinking Water Act**
**Clean Air Act (CAA)**
**Occupational Safety and Health Act (OSHA)**

**The following policies, criteria or guidelines will also be considered (TBCs) during the implementation of the remedial action:**

**Executive Order 11988 (Floodplain Management)**
Executive Order 11990 (Protection of Wetlands)
TSCA PCB Spill Policy

State environmental regulations which are applicable or relevant and appropriate to the selected remedial action at the site are:

Dept. of Environmental Protection (DEP) Regulations
    Hazardous Waste Regulations
    Wetlands Protection Regulations
    Certification for Dredging and Filling in Waters
    Air Quality Standards
    Air Pollution Control Regulations
    Surface Water Quality Standards
    Groundwater Quality Standards
    Supp. Requirements for Hazardous Waste Management Facilities

Tables 16, 17, and 18 provide a synopsis of the applicable or appropriate chemical-, location- and action-specific requirements for the selected remedy and how this remedy will attain those requirements. A brief discussion of how the selected remedy meets those requirements follows:

1. Groundwater

Safe Drinking Water Act MA/DEP Drinking Water Regulations/MA DEP Groundwater Quality Standards

The groundwater at the Norwood PCB Site is not currently used as a drinking water source, but is classified by EPA and Massachusetts as a potential drinking water source. Maximum Contaminant Levels (MCLs) promulgated under the Safe Drinking Water Act and Massachusetts Drinking Water Standards, which regulate public drinking water supplies, are not applicable. However, because the groundwater could potentially be used as a drinking water source, MCLs and MA drinking water standards are relevant and appropriate. Moreover, Massachusetts has groundwater quality standards for a number of site contaminants which establish the same level as the MCL for the respective chemical. Minimum Groundwater Criteria established under the Massachusetts Groundwater Quality Standards are applicable.

Meeting the groundwater target levels discussed in Section X.A.1.b. will attain these ARARs. Tables 19 and 20 show the MCLs and Groundwater Standards that will be attained.

The groundwater treatment facility will be located outside of the 100-year floodplain. The location of the facility attains the siting requirements of MDWPC Supplemental Requirements for Hazardous Waste Management Facilities.

The proposed location is within the areal extent of contamination, and is considered to be part of the site for the purposes of Section 121(e) of CERCLA. Therefore, no groundwater discharge permit is required. Discharges from the treatment facility into the groundwater recharge system will attain ARARs, (SDWA, MA Groundwater Standards).

## 2. Soils and Sediments

The applicable or relevant and appropriate requirements for the excavation, treatment and disposal of the contaminated soils, sediments and dredge pile materials are regulations promulgated pursuant to TSCA, RCRA and DEP Hazardous Waste Management Regulations.

### Toxic Substances Control Act

The PCB Disposal Requirements promulgated under TSCA are applicable to the remedy because the selected remedy involves storage and disposal of soils and sediments and liquids contaminated with PCBs in excess of 50 ppm. The PCB-contaminated extract produced from the solvent extraction treatment will be treated off-site in an incinerator meeting the standards of 40 C.F.R. §761.69. Under the Disposal Requirements, soils and sediments contaminated with PCBs may be disposed of in an incinerator meeting the standards of 40 C.F.R. § 761.69 or a landfill meeting the requirements of 40 C.F.R. § 761.75. Under the provisions of 40 C.F.R. § 761.75(c)(4), the EPA Regional Administrator may waive one or more of the specified landfill requirements upon finding that the requirement is not necessary to protect against an unreasonable risk of injury to health or the environment from PCBs.

In this case, placement of soils, sediments and dredge pile materials with PCB levels no greater than 10 ppm under a 10 inch soil cover or asphalt and construction of a groundwater collection trench will provide a permanent and protective remedy that satisfies the requirements of the Part 761 landfill regulations. Long-term monitoring of groundwater wells will also be instituted, as required by the chemical waste landfill regulations.

The Regional Administrator is exercising the waiver authority contained within the TSCA regulations at 40 C.F.R. § 761.75(c)(4), and is waiving certain requirements of the chemical waste landfill regulations. The provisions to be waived require construction of chemical waste landfills in certain low permeable clay conditions [40 C.F.R. § 761.75(b)(1)], the use of a synthetic membrane liner [§ 761.75(b)(2)], and that the bottom of the landfill be 50 feet above the historic high water table [§ 761.75(b)(3)].

The Regional Administrator hereby determines that, for the following reasons, the requirements of 40 C.F.R. §§ 761.75(b)(1), (2) and (3) are not necessary to protect against an unreasonable risk of injury to health or the environment from PCBs in this case.

The primary reason that the waived specifications are not necessary is that contaminated soils and sediments with PCB concentrations greater than 50 ppm will be treated to the PCB soil target cleanup level of 10 ppm prior to on-site disposal. As described in Section X.A.1.a., reducing the concentrations of residual contaminants to the PCB soil target levels will result in an incremental carcinogenic risk level of $5x10^{-6}$ from exposure to PCB-contaminated soils under both current and future use site conditions. In addition, placement of 10 inches of a clean soil cover over treated soils will further reduce potential risks associated with direct contact with and incidental ingestion of contaminated soils. As specified in the TSCA PCB Spill Policy, placement of a 10 inch soil cover would reduce risks associated with contact with contaminated soils by a factor of 10. The combination of treatment of contaminated solids to the PCB target level described above and placement of a 10 inch soil cover will result in an incremental carcinogenic lifetime risk level to workers of $5x10^{-7}$ from exposure to PCB-contaminated soils under both current and future manufacturing use of this area. In contrast, the landfill requirements that are waived are designed to protect against the risks from disposal of PCBs at levels no lower than 50 ppm. The specifications regarding liners, soil conditions and depth to groundwater are designed to protect against the risks that high levels of PCBs will migrate into groundwater, or be released to air or surface water.

**Low permeability clay conditions for the underlying substrate are not necessary at this Site to prevent migration of PCBs. Treated soils with residual PCB concentrations less than 10 ppm will be disposed of on-site in excavated areas within the unsaturated zone at the Site. Disposal of the treated soils within the unsaturated zone will minimize the hydraulic connection between the treated soils and groundwater and subsequent PCB migration of PCBs in groundwater. In addition, PCBs at these low levels would not be expected to pose a risk to groundwater from soil dissolution. Based on the range of total organic carbon values from on-site soil samples, the FS estimated that critical PCB soil concentrations of up to 40 ppm PCBs would attain 1 part per billion PCB in leachate entering groundwater. Considering the low PCB concentrations of treated soils (<10 ppm) and selection of the unsaturated zone for disposal, the migration of PCBs from treated soils to groundwater will be minimal.**

**The factors described above are also pertinent when evaluating the synthetic membrane liner and 50 feet to the water table requirements. The requirements are waived primarily, because of the limited hydraulic connection between groundwater, and the low PCB levels in soils at less than 10 ppm that will be disposed on-site. Furthermore, given the low mobility of PCBs in soils, migration of PCBs from treated soils to groundwater would be minimal.**

This remedy will also comply with the storage requirements of the PCB Disposal Regulations by the construction of a storage area meeting the standards of 40 C.F.R. § 761.65.

### Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act

The Commonwealth of Massachusetts has been authorized by EPA to administer and enforce RCRA programs in lieu of the federal authority. The state requirements are either equivalent to or more stringent then the federal RCRA regulations. Compliance with Massachusetts Hazardous Wastes Regulations (310 CMR 30.00) is discussed below. However, federal regulations promulgated under the Hazardous and Solid Waste Amendments to RCRA (HSWA) are potentially applicable.

The applicability of HSWA regulations as action-specific requirements for disposal depends on whether the wastes are hazardous, as defined under RCRA. The agency has determined that none of the wastes in the soils, sediments, and dredge pile materials at the Norwood PCB site are listed or characteristic hazardous wastes under RCRA. Accordingly, HWSA Land Disposal Restrictions (LDR) will not be applicable because placement of the treated solids on the land will not

**constitute disposal of a hazardous waste. The Agency is undertaking a rulemaking that will specifically apply to soil and debris. Since that rulemaking is not yet complete, EPA does not consider LDR to be relevant and appropriate at this Site to soil and debris that does not contain RCRA restricted waste. In order to determine the applicability of HSWA land disposal restrictions for the metal sludge generated from the groundwater treatment system, this sludge will be tested to determine whether it exhibits characteristics of hazardous waste. If the metal sludge is determined to be a restricted RCRA hazardous waste, the HSWA land disposal restrictions would be applicable. In such a case, the metal sludge will be pretreated consistent with LDR prior to off-site disposal. Off-site disposal by incineration will comply with LDR for any PCB-containing liquids from the solvent extraction process that meet the definitions of California list wastes in 40 C.F.R. § 268.32.**

**The minimum technology standards for landfills are federal requirements promulgated pursuant to HSWA that are not applicable because disposal will not involve a hazardous waste.** In this case, those requirements landfill may be relevant but are not appropriate because the PCB disposal and landfill requirement of 40 CFR Part 761 have been designed to apply to the specific component of this remedy that requires disposal of PCB- contaminated soils and sediments and more fully match the circumstances at the Site.

### Massachusetts DEP Hazardous Waste Regulations [3]

Massachusetts DEP Hazardous Waste Regulation establishing general hazardous waste facility management standards are relevant and appropriate to the remedial activities that will implement this remedy, because the CERCLA remedial activities are similar to the activities of an operating hazardous waste facility, to the extent that the actions are not already governed by PCB regulations at 40 CFR Part 761.

Implementation of the remedy will comply with the following provisions of the Massachusetts hazardous waste regulations

---

[3] Massachusetts Hazardous Waste Regulations are not applicable, because the remedial action implementing this Record of Decision will be initiated or ordered by DEP as well as EPA. In such circumstances, no license pursuant to the Massachusetts hazardous waste statute and DEP hazardous waste regulations is required. 310 CMR 30.801(11). Accordingly, DEP does not require strict compliance with all hazardous waste regulations for such remedial actions, but only requires compliance with the relevant and appropriate substantive sections of those regulations.

## TABLE 19
## FEDERAL AND STATE STANDARDS AND CRITERIA FOR SUMMARY OF CHEMICALS OF POTENTIAL CONCERN IN GROUND WATER
## NORWOOD PCB SITE
(All concentrations in ug/liter)

| CHEMICAL | MAXIMUM CONTAMINANT LEVELS (relevant and appropriate) | MASSACHUSETTS GROUNDWATER STANDARDS (applicable) | MASSACHUSETTS DRINKING WATER STANDARDS (relevant and appropriate) |
|---|---|---|---|
| Chlorinated Aliphatics | | | |
| Vinyl Choride | 2 | 2 | 2 |
| 1,1-Dichloroethene | 7 | 7 | 7 |
| 1,1-Dichlorethane | -- | -- | -- |
| trans-1,2 Dichlorethene | -- | -- | -- |
| 1,1,1-Trichloroethane | 200 | 200 | 200 |
| Trichloroethene | 5 | 5 | 5 |
| Tetrachloroethene | -- | 5 | -- |
| Chloroform | -- | -- | -- |
| Monocyclic Aromatics | | | |
| Benzene | 5 | 5 | 5 |
| Toluene | -- | 2,000 | -- |
| Chorobenzene | -- | -- | -- |
| 1,2-Dichlorobenzene | 20 | 600 | -- |
| Ethylbenzene | -- | 700 | -- |
| Xylenes | -- | 1,000 | -- |
| 1,4-Dichlorobenzene | 75 | 5 | -- |
| Other Volatiles | | | |
| Acetone | -- | 700 | -- |
| Semi-Volatiles | | | |
| Diethyl Phthalate | -- | -- | -- |
| Bis(2-ethylhexyl) phthalate | 10 | 10 | -- |
| Naphthalene | -- | -- | -- |
| Di-n-butylphthalade | -- | -- | -- |
| Carcinogenic PAHs | -- | -- | -- |
| PCBs | -- | -- | -- |
| Inorganics | | | |
| Copper | -- | 1,000 | -- |
| Nickel | -- | -- | -- |
| Qualitative Assessment Only | | | |
| Noncarcinogenic PAHs | -- | -- | -- |
| Cobalt | -- | -- | -- |

at 310 CMR 30.00: General management standards for all

facilities (310 CMR 30.510-516); Contingency plan, emergency procedures, preparedness, and prevention (310 CMR 30.520-524); Manifest system (310 CMR 30.530-534); Closure and post-closure (310 CMR 30.580-595); Groundwater protection (310 CMR 30.660-675); Use and management of containers (310 CMR 30.680-689). The placement of contaminated soils, sediments, and dredge pile materials under a soil cover will occur outside the 100-year floodplain, in accordance with location standards in the Massachusetts Hazardous Waste Regulations.

The groundwater monitoring program will comply with the groundwater protection regulations under the DEP regulations. It is possible that the frequency of groundwater monitoring will differ from semi-annual monitoring requirements under this portion of the regulations, which are not appropriate for this remedy. While this remedy requires quarterly monitoring during construction and implementation, the primary purpose of groundwater monitoring for the remedy is to assess the effectiveness of the groundwater collection and treatment program.

### 3. Surface Water

#### Clean Water Act

Some regulations under the Clean Water Act are applicable to the discharge of stormwater/wastewater to the surface waters of Meadow Brook, or any other designated surface water body. Under Section 121(e) of CERCLA, no permit is required under the NPDES program for the remedial action performed under CERCLA, because the effluent from the Grant Gear drainage system will be discharged directly into a surface water of the U.S. at a point considered part of the CERCLA site. However, Grant Gear must obtain a NPDES permit to authorize and regulate in the short- and long-term their continuing discharge of pollutants into Meadow Brook from on-going manufacturing operations and use of the Grant Gear building which is not part of the remedial action.

#### Massachusetts Surface Water Quality Standards

Massachusetts water quality standards for discharges to surface waters are applicable to discharges to Meadow Brook, or any other designated surface water body. Meadow Brook is classified as Class B, for the uses and protection of propagation of fish, aquatic life and wildlife, and for primary and secondary contact recreation. In addition, Meadow Brook is classified as an anti-degradation stream for the protection of low flow waters, where new or increased discharges of hazardous substances are not allowed unless no other feasible discharge alternative exists. Discharge limits, as established in a NPDES permit, for all hazardous substances in the effluent from the Grant Gear discharge system will be consistent with state water quality standards. EPA anticipates discharge effluent limits, as specified in the Grant Gear NPDES permit, will incorporate federal ambient water quality criteria and/or practical detection limits.

The proposed cleanup level for PCBs in the effluent discharging to Meadow Brook from the drainage system has been set at 0.5 ppb. This value is based on a practical detection limit for the analysis of PCBs and was specified in Grant Gear's draft NPDES permit proposed in 1988.

### Floodplains and Wetlands ARARs

Regulations under Section 404 of the Clean Water Act are applicable, because restoration of the Meadow Brook area will involve a discharge of dredged or fill material. The Agency has determined that in this case there is no other practicable alternative which would address PCB contamination in soils and sediments but which would also have a less adverse impact on the aquatic ecosystem. The selected remedy will comply with the substantive requirements of Section 404 to minimize adverse impacts to the aquatic ecosystem, by creating sedimentation basins or using silt curtains during dredging operations, and by restoring the stream and wetlands, to the extent feasible.

In addition, the policies expressed in Executive Orders regarding wetlands and floodplains were taken into account in the selected remedy. The remedy will include steps to minimize the destruction, loss, or degradation of wetlands in accordance with Executive Order 11990, and will include steps to reduce the risk of floodplain loss in accordance with Executive Order 11988.

DEP Wetlands Protection Regulations concerning dredging, filling or altering inland wetlands are applicable to the dredging of Meadow Brook. The remedial action will comply with the performance standards of the regulations regarding banks, bordering vegetated wetlands, lands under water bodies and waterways and land subject to flooding.

Because the Meadow Brook area is within the areal extent of contamination, it is considered part of the site, and no permits will be necessary.

### Air

Standards for particulate matter under the Clean Air Act and DEP Air Quality and Air Pollution regulations are applicable and will be attained during construction phases and during

**operation of the groundwater treatment system (air stripper).**

**OSHA**

**OSHA standards for general industries and health and safety standards are applicable and will be attained.**

**Department of Transportation Regulations**

**Any hazardous wastes transported for off-site disposal, including any solids extracted during the groundwater treatment program, will be transported in accordance with Department of Transportation regulations.**

### C. The Selected Remedial Action is Cost-Effective

**EPA is required under the NCP to evaluate closely the costs required to implement and maintain a remedy and to select cost-effective remedies. Of the remedial alternatives that are protective and attain all ARARs, EPA's selected remedy is cost-effective.**

**Of the source control alternatives for soils, sediments and dredge pile materials remediation, EPA has determined that** solvent extraction (selected treatment) followed by off-site incineration of the PCB-contaminated oil extract, and on-site incineration (backup treatment) would be the most effective in permanently and significantly reducing the toxicity, mobility and volume of hazardous substances and in reducing contaminant levels in soils, sediments and dredge pile materials to cleanup levels. A comparison of present worth costs for solvent extraction and on-site incineration indicates that the present worth costs for solvent extraction is lower than on-site incineration, $13.3 million versus $17.2 million, respectively.

While the limited action and containment alternatives are cheaper than the selected source control alternative (solvent extraction) or the backup alternative (on-site incineration), they do not provide the same degree of short- and long-term effectiveness and permanence. As stated above, the selected source control alternative (solvent extraction/off-site incineration) is less expensive than the only other equally effective treatment alternative (on-site incineration). Thus, the selection of solvent extraction as the source control alternative for soils, sediments and dredge pile remediation is cost-effective because its costs are proportionate to its effectiveness in reducing contaminants to protective levels.

Of the four alternatives for the remediation of the Grant Gear drainage system, EPA selected flushing followed by limited containment. This selection was based primarily on

**the reduction of toxicity, mobility and volume (T,M,V) of hazardous substances achieved by flushing/containment when followed by treatment of purged solids. None of the other alternatives, individually or in combination, would achieve the same degree of reduction. In particular, there is significant uncertainty that flushing alone would be effective in achieving the target cleanup levels as described in Section X.A.1.d. Containment alone or off-site disposal of the drainage system would not achieve any reduction of T,M,V of hazardous substances. Off-site disposal is also the least preferred alternative under CERCLA. In view of the high levels of contaminants in the drainage system and the greater degree of reduction of T,M,V of hazardous substances achieved by flushing/containment, EPA has determined that flushing/containment of the Grant Gear drainage system is cost-effective alternative because its costs are proportionate to its overall effectiveness.**

**EPA has determined that decontamination is the only effective and implementable alternative for remediation of machinery/equipment and floor surfaces. Because decontamination is the only effective alternative in reducing the toxicity, mobility and volume of contaminants on such surfaces, it is therefore cost-effective.**

Three treatment technologies for remediation of VOCs in groundwater were evaluated in detail in the FS (Ebasco, 1989c). EPA has determined that all three treatment alternatives (air stripping, carbon adsorption, ultraviolet/oxidation) would be effective in achieving the management of migration response objectives outlined in Section VIII A. In addition, a comparison of present worth costs associated with these three alternatives indicates that the costs of each are relatively equal. Therefore, all of the three alternatives are equally cost-effective.

Table 21 presents the estimated total cost of the remedy by elements, capitol costs, operation and maintenance costs and present worth.

### D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy utilizes permanent solutions to the maximum extent practicable. In particular, solvent extraction of soils, sediments and dredge pile materials followed by off-site incineration of the oil extract, or on-site incineration of soils as the backup treatment, will permanently reduce contaminants in on-site solids to protective levels. In addition, removal of the soil contaminants will reduce the source of groundwater contaminants, increasing the long-term effectiveness of that component of the remedy.

Decontamination of Grant Gear equipment/machinery and floor surfaces will permanently reduce the PCB levels on such surfaces. Flushing of the Grant Gear drainage system followed by on- or off-site treatment of purged solids will permanently reduce the levels of hazardous substances in the Grant Gear drainage system. The management of migration portion of the remedy also utilizes a treatment method which will result in the permanent removal of targeted contaminants.

Solvent extraction, which is the selected soil remedy is an alternative treatment technology. This alternative will be used, if technically practicable.

### E. The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

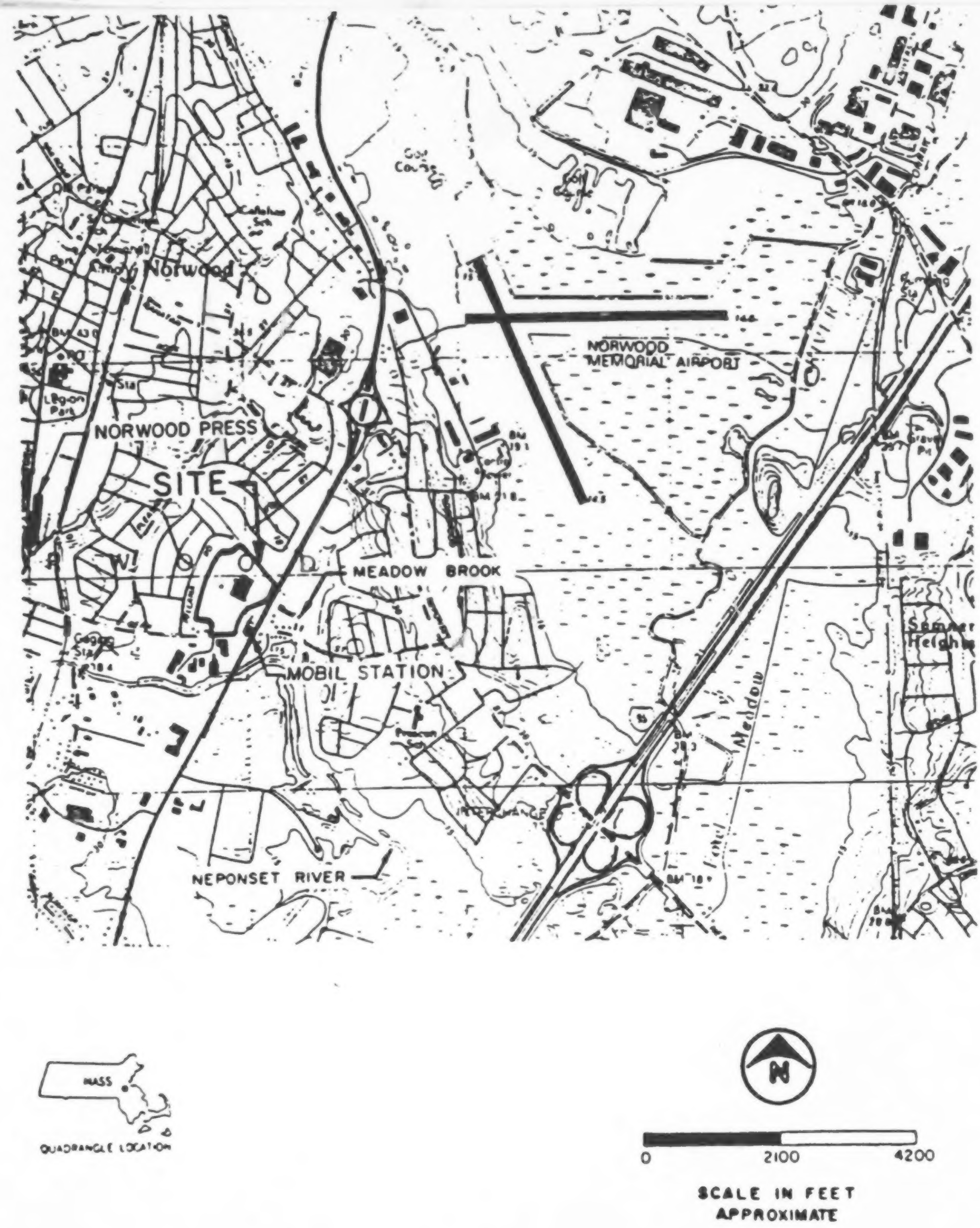
The principal elements of the selected remedy are the source control alternatives and the management of migration alternatives. These elements address the primary threat at the Site, contamination of soils, sediments, dredge pile materials, office equipment surfaces, drainage system and groundwater. The selected remedy satisfies the statutory preference for treatment as a principal element by incorporating the following components:

1. Solvent extraction (on-site incineration-backup treatment) of soils, sediments, dredge pile materials;
2. Off-site incineration of PCB-contaminated oil extract;
3. Off-site incineration of waste residuals from decontamination of equipment;
4. On-site solvent extraction (off-site incineration-backup treatment) for purged solids from flushing of the drainage system; and
5. Air stripping, and additional treatments as needed, of collected on-site groundwater.

## XII. STATE ROLE

The Massachusetts Department of Environmental Protection (MA DEP) has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation and the Feasibility Studies to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. MA DEP concurs with the selected remedy for the Norwood PCB Site. A copy of the declaration of concurrence is attached as Appendix C.

In accordance with Section 104 of CERCLA, the Commonwealth of Massachusetts is responsible for at least 10 percent of the costs of the remedial action, and all future operation and maintenance of the remedial action.


Norwood
NORWOOD PRESS
SITE
Golf Course
NORWOOD MEMORIAL AIRPORT
MEADOW BROOK
MOBIL STATION
Meadow
INTERCHANGE
NEPONSET RIVER
MASS
QUADRANGLE LOCATION
N
0
2100
4200
SCALE IN FEET
APPROXIMATE

REFERENCE

USGS 7.5' X 15' METRIC
TOPOGRAPHIC MAP, NORWOOD
QUADRANGLE, 1985
SCALE 1:25000

FIGURE 1
SITE LOCATION

# Norwood PCB Site

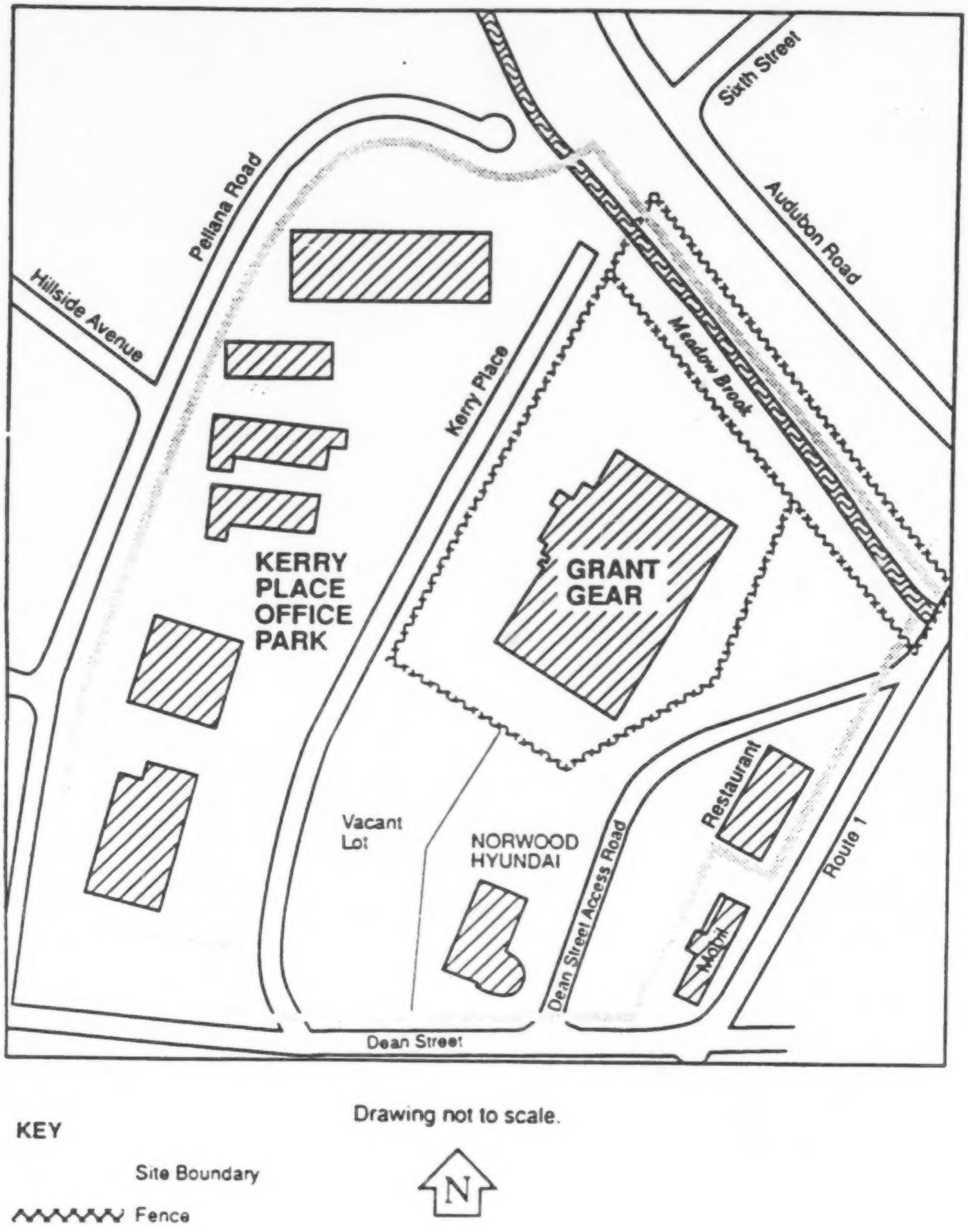
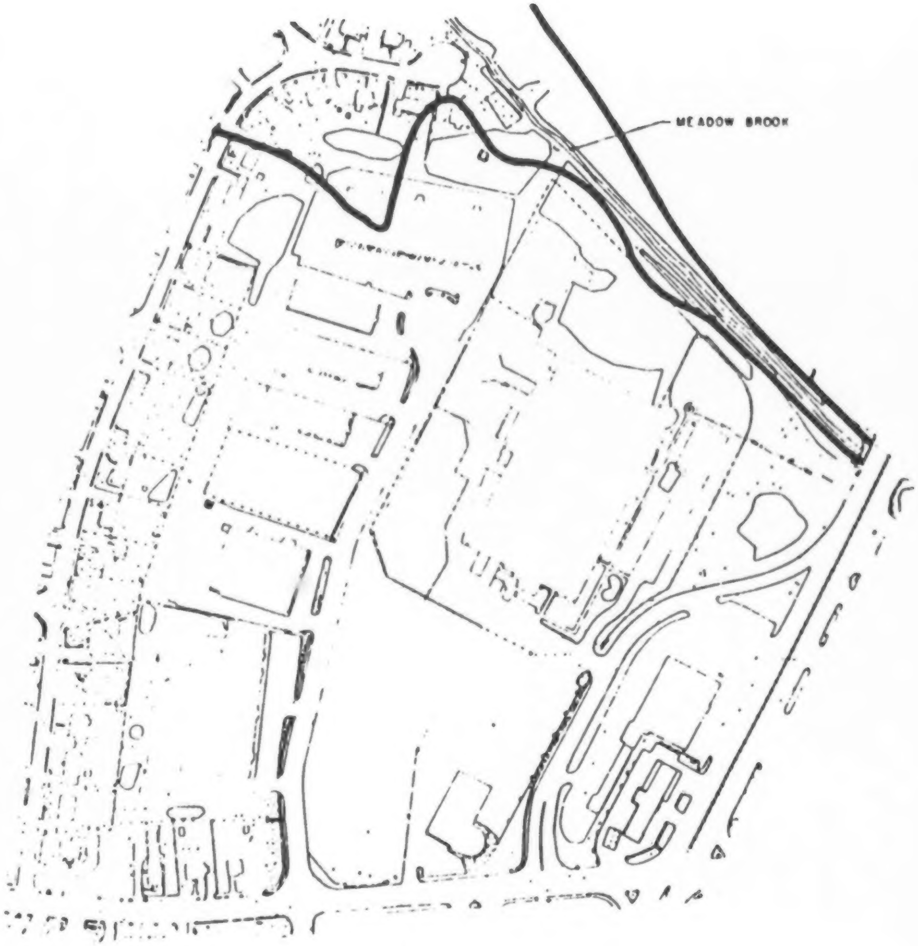

Sixth Street
Audubon Road
Pellana Road
Hillside Avenue
Kerry Place
Meadow Brook
KERRY PLACE OFFICE PARK
GRANT GEAR
Vacant Lot
NORWOOD HYUNDAI
Dean Street Access Road
Restaurant
Route 1
Mobil
Dean Street
Drawing not to scale.
KEY
Site Boundary
Fence
N

FIGURE 2

Reproduced from best available copy.



LEGEND

— LIMITS OF 100-YEAR FLOOD PLAIN

NOTES

1. FLOOD PLAIN DELINEATION BASED ON U S DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (1980)
2. FLOOD PLAIN MAP PREDATES COMMERCIAL CONSTRUCTION AT KERRY PLACE

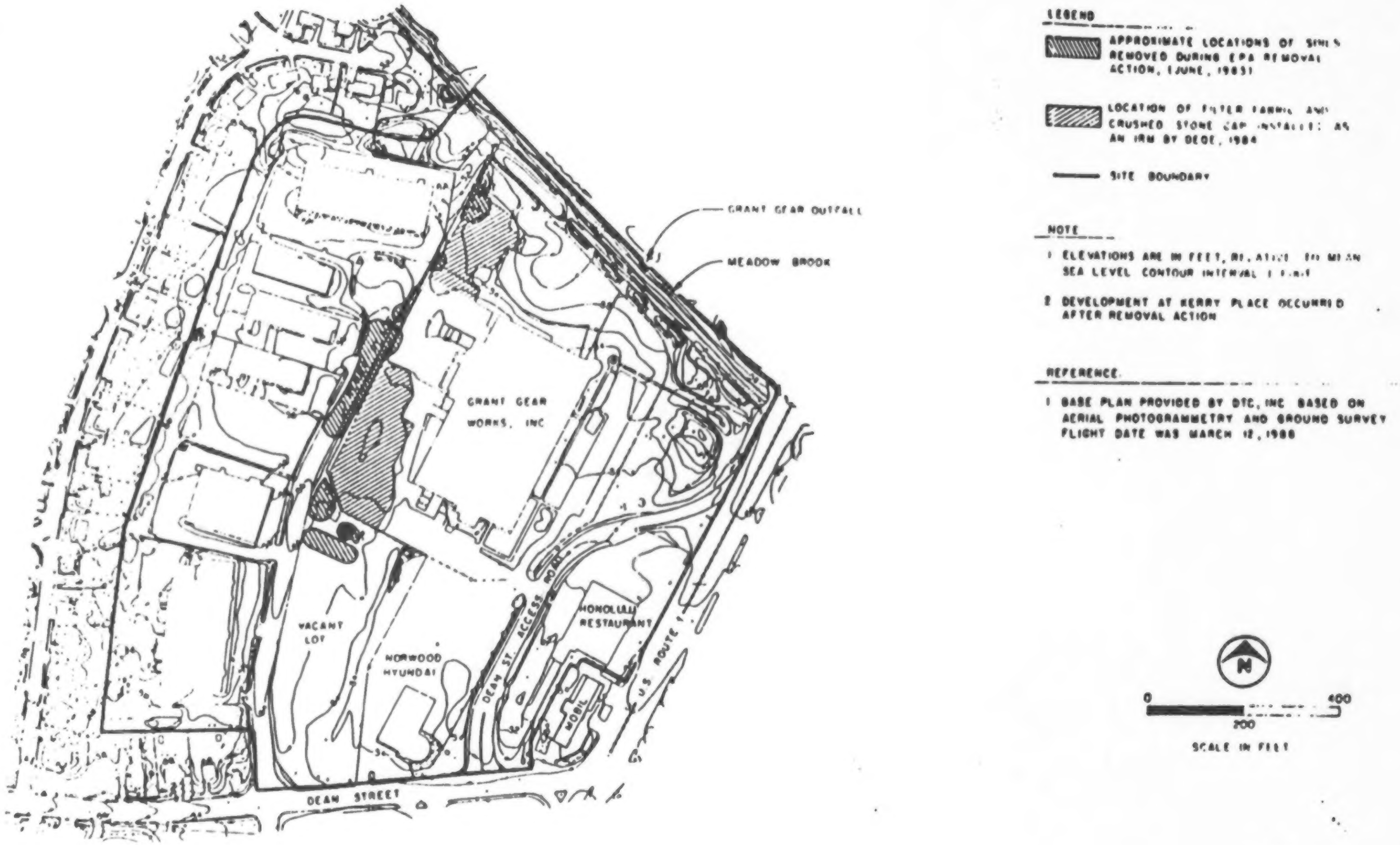
REFERENCE:

BASE PLAN PROVIDED BY DTC, INC., BASED ON AERIAL PHOTOGRAMMETRY AND GROUND SURVEY. FLIGHT DATE WAS MARCH 17, 1988

N
0
200
400
SCALE IN FEET

FIGURE 3
MEADOW BROOK
100-YEAR FLOOD PLAIN
NORWOOD PCB SITE #1

Reproduced from
best available copy.


GRANT GEAR OUTFALL
MEADOW BROOK
GRANT GEAR WORKS, INC
HONOLULU RESTAURANT
MOBIL
U.S. ROUTE 1
DEAN ST. ACCESS ROAD
NORWOOD HYUNDAI
VACANT LOT
DEAN STREET
N
0
200
400
SCALE IN FEET

LEGEND

▨ APPROXIMATE LOCATIONS OF SINKS REMOVED DURING EPA REMOVAL ACTION, (JUNE, 1983)

▨ LOCATION OF FILTER FABRIC AND CRUSHED STONE CAP INSTALLED AS AN IRM BY DEQE, 1984

— SITE BOUNDARY

NOTE

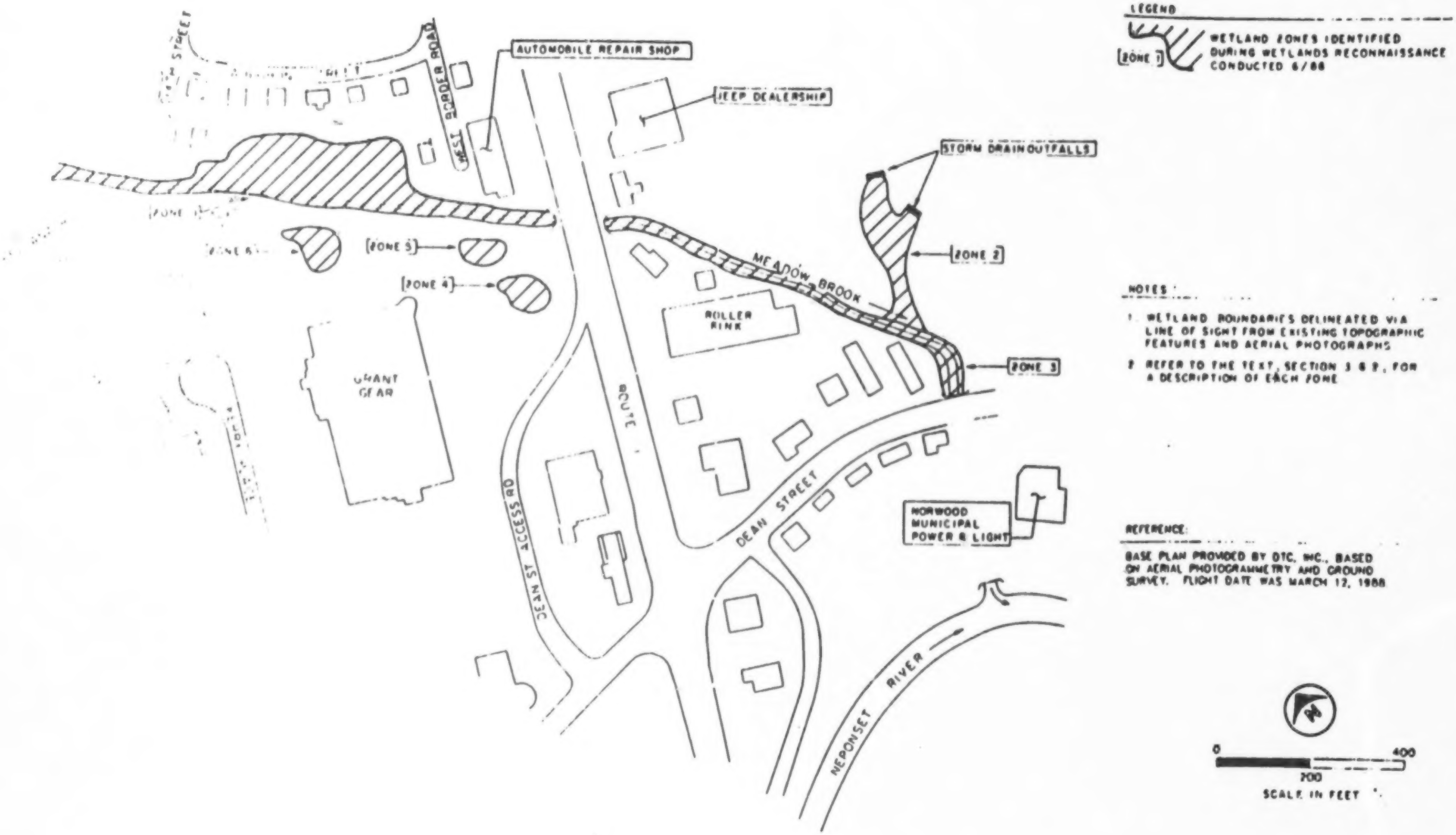
1 ELEVATIONS ARE IN FEET, RELATIVE TO MEAN SEA LEVEL CONTOUR INTERVAL 1 FOOT

2 DEVELOPMENT AT KERRY PLACE OCCURRED AFTER REMOVAL ACTION

REFERENCE

1 BASE PLAN PROVIDED BY DTC, INC BASED ON AERIAL PHOTOGRAMMETRY AND GROUND SURVEY FLIGHT DATE WAS MARCH 12, 1988

FIGURE 4
SITE PLAN


STREET
WEST BORDER ROAD
AUTOMOBILE REPAIR SHOP
JEEP DEALERSHIP
STORM DRAIN OUTFALLS
ZONE 2
ZONE 3
ZONE 4
ZONE 5
ZONE 6
ZONE 1
MEADOW BROOK
ROLLER RINK
GRANT GEAR
ROUTE 1
DEAN ST ACCESS RD
DEAN STREET
NORWOOD MUNICIPAL POWER & LIGHT
NEPONSET RIVER
0
200
400
SCALE IN FEET

LEGEND

ZONE 1 — WETLAND ZONES IDENTIFIED DURING WETLANDS RECONNAISSANCE CONDUCTED 6/88

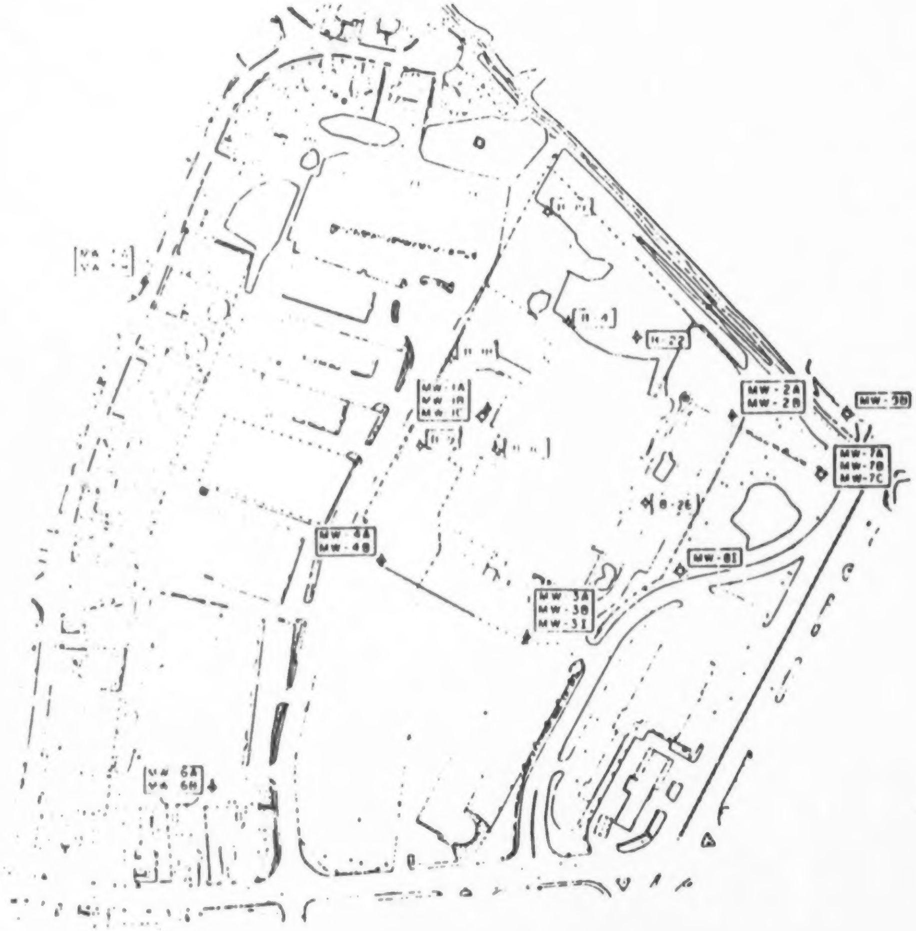
NOTES:

1. WETLAND BOUNDARIES DELINEATED VIA LINE OF SIGHT FROM EXISTING TOPOGRAPHIC FEATURES AND AERIAL PHOTOGRAPHS
2. REFER TO THE TEXT, SECTION 3.8.2, FOR A DESCRIPTION OF EACH ZONE

REFERENCE:

BASE PLAN PROVIDED BY DTC, INC., BASED ON AERIAL PHOTOGRAMMETRY AND GROUND SURVEY. FLIGHT DATE WAS MARCH 12, 1988

FIGURE 5
WETLAND ZONES
NORWOOD PCB SITE RI


MW-1A
MW-1B
MW-1C
MW-2A
MW-2B
MW-3A
MW-3B
MW-3I
MW-4A
MW-4B
MW-6A
MW-6B
MW-7A
MW-7B
MW-7C
MW-8I
MW-9B
B-4
B-22
B-26
0
200
400
SCALE IN FEET
N

LEGEND:

| | |
|---|---|
| B-4 | MONITORING WELL INSTALLED 12/85 THROUGH 1/86 BY WEHRAN ENGINEERING |
| MW-1A | MONITORING WELL NEST INSTALLED 3/88 THROUGH 4/88 DURING RI |
| MW-7A | MONITORING WELL INSTALLED 3/18/89 THROUGH 4/9/89 DURING PHASE II RI |

NOTES:

1. LOCATIONS OF WELLS B-4 THROUGH B-28 TAKEN FROM GZA (1988), FIGURE 4, REPRODUCED IN APPENDIX A.
2. LOCATIONS OF WELLS MW-1A THROUGH MW-9B DETERMINED BY GROUND SURVEY

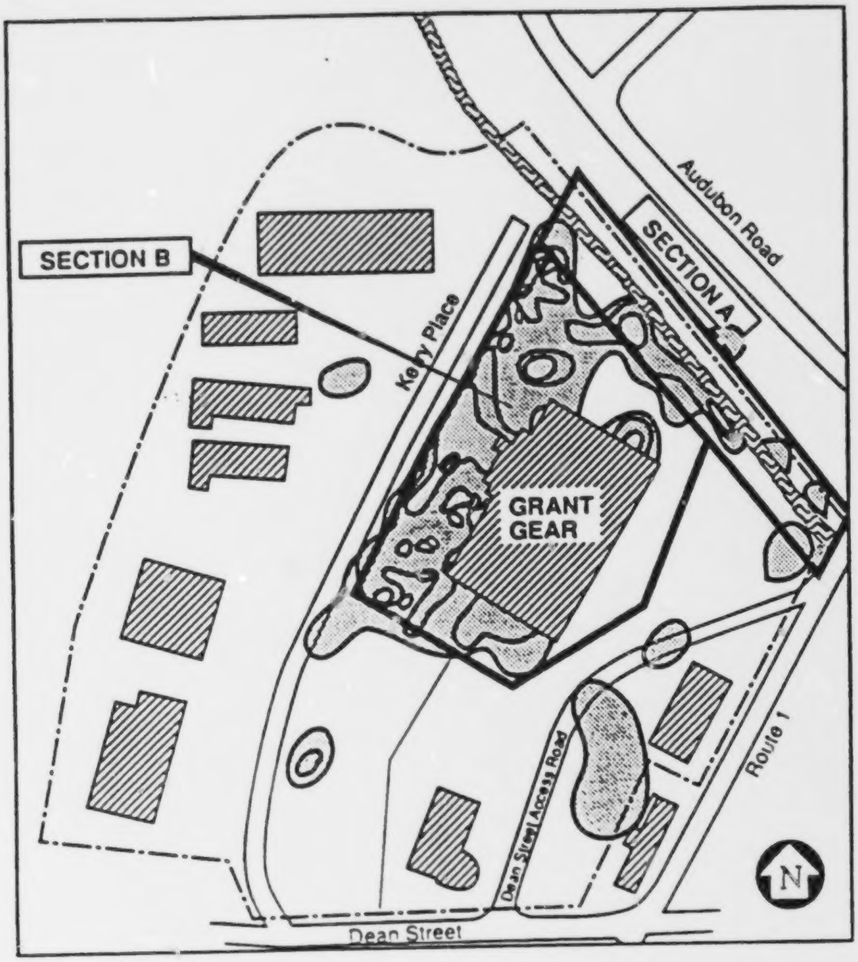
REFERENCE:

BASE PLAN PROVIDED BY DTC, INC., BASED ON AERIAL PHOTOGRAMMETRY AND GROUND SURVEY. FLIGHT DATE WAS MARCH 12, 1988.

FIGURE 6
REMEDIAL INVESTIGATION:
GROUND WATER SAMPLING STATIONS
NORWOOD PCB SITE

Reproduced from best available copy.

_: Target Cleanup Levels for Norwood PCB Site Soils


SECTION B
SECTION A
Audubon Road
Kerry Place
GRANT GEAR
Route 1
Dean Street Access Road
Dean Street
N

KEY

—·—·—·— Site Boundary

▬ Fence

**SECTION A** —Target cleanup level is 1 ppm PCBs

**SECTION B** —Target cleanup level is 10 ppm PCBs

Drawing not to scale

FIGURE 7

## TABLE 1
## SURFICIAL SOIL CONTAMINANT CONCENTRATIONS
## NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/kg) Average Detection | Concentration (ug/kg) Maximum Detection |
|---|---|---|---|
| PCBs | | | |
| Aroclor-1254 | 278/312 | 886,000 | 26,000,000 |
| Chlorinated Aliphatics | | | |
| Methylene chloride | 5/34 | 31 | 41 |
| Chloroform | 3/34 | 24 | 46 |
| 1,1-Dichloroethane | 5/34 | 20 | 42 |
| 1,2-Dichloroethane | 5/34 | 123 | 330 |
| 1,1,1-Trichloroethane | 4/34 | 24 | 54 |
| 1,1,2-Trichloroethane | 4/34 | 26 | 42 |
| Trichloroethene | 1/34 | 6 | 6 |
| Tetrachloroethene | 4/34 | 33 | 67 |
| Phenols | | | |
| Phenol | 1/34 | 2,300 | 2,300 |
| Chlorobenzenes | | | |
| 1,2,4-Trichlorobenzene | 1/34 | 82 | 82 |
| PAHs | | | |
| Naphthalene | 1/34 | 150 | 150 |
| 2-Methynaphthalene | 2/34 | 78 | 88 |
| Acenaphthalene | 4/34 | 200 | 270 |
| Acenaphthene | 3/34 | 123 | 180 |
| Dibenzofuran | 2/34 | 120 | 200 |
| Fluorene | 5/34 | 61 | 100 |
| Phenanthrene | 15/34 | 530 | 2,800 |
| Anthracene | 7/34 | 303 | 680 |
| Fluoranthene | 24/34 | 651 | 2,800 |
| Pyrene | 25/34 | 568 | 3,500 |
| Benzo(a)anthracene | 14/34 | 580 | 2,000 |
| Chrysene | 17/34 | 552 | 2,100 |
| Benzo(b)fluoranthene | 14/34 | 1,370 | 5,300 |
| Benzo(k)flouranthene | 8/34 | 1,130 | 5,300 |
| Benzo(a)pyrene | 14/34 | 670 | 2,700 |
| Indeno(1,2,3-cd)pyrene | 12/34 | 424 | 1,900 |
| Dibenzo(a,h)anthracene | 4/34 | 331 | 800 |
| Benzo(g,h,i)perylene | 9/34 | 466 | 1,700 |

|  |  |  |  |
|---|---|---|---|
| **Other Semi-Volatiles** |  |  |  |
| Benzoic Acid | 7/34 | 483 | 1,200 |
| **Metals** |  |  |  |
| Cadmium | 22/34 | 2.9 | 7.0 |
| Copper | 34/34 | 35 | 297 |
| Silver | 6/34 | 5.6 | 20 |
| Zinc | 34/34 | 56 | 160 |

**NOTES:**

1. Frequency of detection is the number of samples taken at different locations in which compound was detected divided by the number of samples for which the compound was analyzed (including blanks and duplicates). CLP PCB data not included in frequency of detection, average concentration, or maximum concentration when mobile laboratory data exists for duplicate samples.

2. Arithmetic average concentration is calculated only for the samples where the compound was detected.

3. Compounds not listed were not detected or not considered site-related.

## TABLE 2
## SUBSURFACE SOIL CONTAMINANT CONCENTRATIONS
## NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/kg) | |
|---|---|---|---|
| | | Average Detection | Maximum Detection |
| PCBs | | | |
| Aroclor-1254 | 194/392 | 283,000 | 13,400,000 |
| Aroclor-1260 | 7/54 | 48,000 | 230,000 |
| Chlorinated Aliphatics | | | |
| Chloroform | 5/54 | 2 | 7* |
| 1,2-Dichloroethane | 1/54 | 24 | 24 |
| 1,2-Dichloroethene (total) | 3/54 | 58 | 140* |
| 1,1,2-Trichloroethane | 2/54 | 8 | 8* |
| 1,1,2,2-Tetrachloroethane | 1/54 | 420 | 420 |
| Vinyl chloride | 2/54 | 9 | 12 |
| Trichloroethene | 4/54 | 2,610 | 10,000 |
| Tetrachloroethene | 3/54 | 188 | 420 |
| BTEX | | | |
| Benzene | 1/54 | 1 | 1 |
| Xylenes (total) | 2/54 | 45 | 70 |
| Phenols | | | |
| Phenol | 3/54 | 1,440 | 3,300 |
| 4-Methylphenol | 1/54 | 410 | 410 |
| Chlorobenzenes | | | |
| Chlorobenzene | 2/54 | 16 | 22 |
| 1,3-Dichlorobenze | 2/54 | 124 | 180 |
| 1,4-Dichlorobenze | 3/54 | 420 | 950 |
| 1,2-Dichlorobenze | 1/54 | 220 | 220 |
| 1,2,4-Trichlorobenze | 8/54 | 62,000 | 360,000 |
| PAHs | | | |
| 2-Methylnaphthalene | 1/54 | 100 | |
| Acenaphthene | 1/54 | 78 | 78 |
| Phenanthrene | 6/54 | 190 | 380 |
| Flouranthene | 7/54 | 310 | 850 |
| Pyrene | 7/54 | 340 | 740 |
| Benzo(a)anthracne | 5/54 | 390 | 1,400 |
| Chrysene | 3/54 | 640 | 1,700 |

|  |  |  |  |
|---|---|---|---|
| Benzo(b)fluoranthene | 6/54 | 870 | 3,500 |
| Benzo(k)fluoranthene | 1/54 | 350 | 350 |
| Benzo(a)pyrene | 4/54 | 1,100 | 3,800 |
| Indeno(1,2,3-cd)pyrene | 4/54 | 740 | 2,400 |
| Dibenzo(a,h)anthracene | 1/54 | 570 | 570 |
| Benzo(g,h,i)perylene | 4/54 | 600 | 1,800 |
| Other Semi-Volatiles |  |  |  |
| Benzoic acid | 1/54 | 330 | 300 |
| 3,3-Dichlorobenzidene | 1/54 | 1,500 | 1,500 |
| Metals |  |  |  |
| Cadmium | 19/54 | 4.2 | 9.1 |
| Chromium | 27/54 | 16 | 75 |
| Copper | 26/54 | 23 | 265 |
| Nickel | 24/54 | 12 | 29 |
| Silver | 4/54 | 4 | 9 |
| Zinc | 27/54 | 64 | 599 |

* - Maximum concentration detected in background sample.

NOTES: See Table 1.

### TABLE 3
### DREDGE PILE CONTAMINANT CONCENTRATIONS
### NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/kg) Average Detection | Maximum Detection |
|---|---|---|---|
| PCBs | | | |
| Aroclor-1254 | 25/31 | 206 | 3,850,000 |
| Chlorinated Aliphatics | | | |
| Chloroform | 2/7 | 2 | 2 |
| PAHs | | | |
| Naphthalene | 1/7 | 53 | |
| Acenaphthalene | 3/7 | 129 | 230 |
| Dibenzofuran | 1/7 | 42 | 42 |
| Fluorene | 1/7 | 65 | 65 |
| Phenanthrene | 6/7 | 472 | 1,100 |
| Anthracene | 3/7 | 98 | 180 |
| Fluoranthene | 7/7 | 860 | 2,200 |
| Pyrene | 7/7 | 840 | 2,300 |
| Benzo(a)anthracne | 6/7 | 520 | 1,200 |
| Chrysene | 7/7 | 560 | 1,500 |
| Benzo(b)fluoranthene | 6/7 | 920 | 1,600 |
| Benzo(k)fluoranthene | 6/7 | 830 | 1,600 |
| Benzo(a)pyrene | 7/7 | 540 | 1,300 |
| Indeno(1,2,3-cd)pyrene | 7/7 | 330 | 800 |
| Dibenzo(a,h)anthracene | 3/7 | 150 | 270 |
| Benzo(g,h,i)perylene | 7/7 | 330 | 840 |
| Metals | | | |
| Silver | 5/7 | 2.7 | 6.3 |
| Zinc | 7/7 | 78 | 132 |

NOTES: See Table 1.

## TABLE 4
## SEDIMENT CONTAMINANT CONCENTRATIONS
## NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/kg) Average Detection | Concentration (ug/kg) Maximum Detection |
|---|---|---|---|
| **PCBs** | | | |
| Aroclor-1254 | 55/79 | 14,200 | 1,100,000 |
| **Chlorinated Aliphatics** | | | |
| Chloroform | 4/17 | 2 | 6 |
| **Phenols** | | | |
| Phenol | 2/17 | 64 | 76 |
| 2-Methylphenol | 1/17 | 48 | 48 |
| 4-Methylphenol | 4/17 | 226 | 370 |
| 2,4-Dimethylphenol | 1/17 | 81 | 81 |
| **Chlorobenzenes** | | | |
| 1,2,4-Trichlorobenzene | 3/17 | 115 | 130 |
| **PAHs** | | | |
| Naphthalene | 9/17 | 362 | 1,400 |
| 2-Methylnaphthalene | 8/17 | 174 | 670 |
| Acenaphthalene | 7/17 | 134 | 190 |
| Acenaphthene | 11/17 | 771 | 3,800 |
| Dibenzofuran | 11/17 | 554 | 2,600 |
| Fluorene | 12/17 | 725 | 4,800 |
| Phenanthrene | 17/17 | 5,688 | 34,000 |
| Anthracene | 14/17 | 3,020 | 34,000 |
| Fluoranthene | 17/17 | 5,891 | 27,000 |
| Pyrene | 17/17 | 6,182 | 32,000 |
| Benzo(a)Anthracene | 17/17 | 3,067 | 15,000 |
| Chrysene | 17/17 | 2,738 | 1,300 |
| Benzo(b)fluoranthene | 16/17 | 4,953 | 25,000 |
| Benzo(k)fluoranthene | 16/17 | 4,953 | 25,000 |
| Benzo(a)pyrene | 16/17 | 1,826 | 8,700 |
| Indeno(1,2,3-cd)pyrene | 13/17 | 916 | 3,600 |
| Dibenzo(a,h)anthracene | 11/17 | 471 | 1,200 |
| Benzo(g,h,i)perylene | 14/17 | 838 | 3,600 |

| | | | |
|---|---|---|---|
| **Other Semi-Volatiles** | | | |
| 4-Chloroaniline | 6/17 | 112 | 300 |
| **Metals** | | | |
| Chromium | 17/17 | 21 | 119 |
| Copper | 17/17 | 52 | 202 |
| Silver | 15/17 | 6.1 | 21 |
| Zinc | 17/17 | 110 | 298 |

**NOTES**: See Table 1.

# TABLE 5
## DRAINAGE SYSTEM SEDIMENT CONTAMINANT CONCENTRATIONS
## NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/kg)<br>Average Detection | Maximum Detection |
|---|---|---|---|
| **PCBs** | | | |
| Aroclor-1016 | 2/38 | 8,600,000 | 9,000,000 |
| Aroclor-1242 | 1/38 | 500 | 500 |
| Aroclor-1248 | 1/38 | 500 | 500 |
| Aroclor-1254 | 36/38 | 16,700,000 | 180,000,000 |
| **Chlorinated Aliphatics** | | | |
| 1,2-Dichloroethene | 2/10 | 175,000 | 200,000 |
| Trichloroethene | 3/10 | 5,400,000 | 2,200,000 |
| Tetrachloroethene | 2/10 | 26,000 | 52,000 |
| **BTEX** | | | |
| Xylenes (total) | 1/9 | 100,000 | 100,000 |
| **Phenols** | | | |
| Phenol | 1/22 | 400 | 400 |
| 4-Methylphenol | 5/22 | 10,390 | 47,000 |
| 2,4-Dimethylphenol | 1/22 | 600 | 600 |
| **Chlorobenzenes** | | | |
| 1,2-Dichlorobenzene | 1/22 | 830 | 830 |
| 1,3-Dichlorobenzene | 2/22 | 5,400 | 9,500 |
| 1,4-Dichlorobenzene | 7/22 | 5,750 | 13,000 |
| 1,2,4-Trichlorobenzene | 9/22 | 106,420 | 350,000 |
| **PAHs** | | | |
| Dibenzofuran | 4/22 | 9,830 | 17,000 |
| Naphthalene | 7/22 | 6,230 | 19,000 |
| 2-Methylnaphthalene | 7/22 | 2,700 | 9,000 |
| 2-Chloronaphthalene | 2/22 | 1,450 | 1,600 |
| Acenaphthene | 5/22 | 10,760 | 18,000 |
| Flourene | 7/22 | 9,840 | 25,000 |
| Phenanthrene | 16/22 | 33,760 | 165,000 |
| Anthracene | 11/22 | 10,350 | 39,000 |
| Fluroranthene | 15/22 | 27,770 | 190,000 |
| Pyrene | 14/22 | 29,160 | 150,000 |
| Benzo(a)anthracene | 14/22 | 23,020 | 83,000 |

| | | | |
|---|---|---|---|
| Chrysene | 15/22 | 21,730 | 84,000 |
| Benzo(b)flouranthene | 14/22 | 22,630 | 74,000 |
| Benzo(k)flouranthene | 9/22 | 15,170 | 48,000 |
| Benzo(a)pyrene | 13/22 | 21,080 | 65,000 |
| Indeno(1,2,3-cd)pyrene | 8/22 | 22,780 | 55,000 |
| Dibenzo(a,h)anthracene | 4/22 | 9,350 | 15,000 |
| Benzo(g,h,i)perylene | 8/22 | 22,150 | 54,000 |
| Other Semi-Volatiles | | | |
| Benzyl Alcohol | 1/22 | 690 | 690 |
| Metals | | | |
| Arsenic | 6/10 | 30 | 135 |
| Barium | 10/10 | 308 | 1,390 |
| Cadmium | 9/10 | 14 | 37 |
| Chromium | 10/10 | 140 | 419 |
| Cobalt | 3/10 | 18 | 30 |
| Copper | 10/10 | 1,120 | 3,120 |
| Lead | 10/10 | 490 | 963 |
| Mercury | 9/10 | 1.4 | 3.4 |
| Nickel | 9/10 | 45 | 184 |
| Silver | 7/10 | 80 | 172 |
| Vanadium | 8/10 | 90 | 198 |
| Zinc | 10/10 | 1,460 | 9,700 |

NOTES: See Table 1.

# TABLE 6
# SURFACE WATER CONTAMINANT CONCENTRATIONS
# MEADOW BROOK
# NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/l) Average Detection | Concentration (ug/l) Maximum Detection |
|---|---|---|---|
| **Chlorinated Aliphatics** | | | |
| Chloroform | 1/9 | 6 | 6 |
| 1,1-Dichloroethane | 1/9 | 3 | 3 |
| 1,1,1-Trichloroethane | 3/9 | 2 | 3 |
| 1,1,2,2-Tetrachloroethane | 3/9 | 6 | 10 |
| 1,2-Dichloroethene (total) | 2/9 | 2 | 3 |
| Trichloroethene | 2/9 | 3 | |
| Tetrachloroethene | 4/9 | 2 | * |
| Total Chlorinated Aliphatics | 7/9 | 7.4 | 12 |

* - Maximum concentration detected in upstream sample.

NOTES:

1. Frequency of detection is the number of samples taken from different locations in which the compound was detected divided by the number of samples for which the compound was analyzed (including blanks and duplicates).

2. Arithmetic average concentration is calculated only for the samples where the compound was detected.

3. All surface water samples were unfiltered.

4. Compounds not listed were not detected or not considered site-related.

## TABLE 7
## WATER TABLE AQUIFER
## GROUNDWATER CONTAMINANT CONCENTRATIONS
## NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/l) Average Detection | Concentration (ug/l) Maximum Detection |
|---|---|---|---|
| **PHASE I RESULTS** | | | |
| **PCBs** | | | |
| Aroclor-1254 | 11/16 | 34 | 180 |
| **Chlorinated Aliphatics** | | | |
| 1,1,1-Trichloroethane | 1/19 | 3 | 3 |
| 1,1,2-Trichloroethane | 1/19 | 18 | 18 |
| 1,1,2,2-Tetracholoroethane | 1/19 | 53 | 53 |
| Vinyl chloride | 1/19 | 14 | 14 |
| 1,2-Dichloroethene (total) | 5/19 | 77 | 300 |
| Trichloroethene | 9/19 | 230 | 1,800 |
| Tetrachloroethene | 3/19 | 7 | 12 |
| **BTEX** | | | |
| Xylenes (total) | 1/19 | 6 | 6 |
| **Total VOCs** | 13/19 | 203 | 2,149 |
| **Phenols** | | | |
| 2,3,5-Trichlorophenol | 1/16 | 10 | 10 |
| Pentachlorophenol | 1/16 | 190 | 190 |
| **Chlorobenzenes** | | | |
| Chlorobenzenes | 1/19 | 5 | 5 |
| 1,3-Dichlorobenzene | 2/16 | 4 | 4 |
| 1,4-Dichlorobenzene | 2/16 | 14 | 14 |
| 1,2-Dichlorobenzene | 2/16 | 5 | 7 |
| 1,2,4-Trichlorobenzene | 3/16 | 700 | 2,100 |
| **Total SVOCs** | 4/19 | 579 | 2,135 |
| PHASE II RESULTS | | | |
| PCBs | | | |
| Aroclor-1248 | 1/13 | 1.1 | 1.1 |
| Aroclor-1254 | 7/13 | 26 | 99 |

| | | | |
|---|---|---|---|
| *Aroclor-1248 | 1/13 | 4 | 4 |
| *Aroclor-1254 | 4/13 | 3.1 | 4.6 |
| **Aroclor-1254 | 0/3 | 0 | 0 |
| **Chlorinated Aliphatics** | | | |
| 1,1,2-Trichloroethene | 1/13 | 2 | 2 |
| 1,1,2,2-Tetrachloroethene | 1/13 | 110 | 110 |
| Vinyl Chloride | 2/13 | 73 | 120 |
| 1,2-Dichloroethene (total) | 5/13 | 199 | 560 |
| Trichloroethene | 8/13 | 328 | 1,700 |
| Tetrachloroethene | 3/13 | 41 | 87 |
| **Total VOCs** | 7/13 | 568 | 1,172 |
| **Phenols** | | | |
| Pentachlorophenol | 1/13 | 210 | 210 |
| **Chlorobenzenes** | | | |
| Chlorobenzenes | 3/13 | 25 | 38 |
| 1,4-Dichlorobenzene | 3/13 | 48 | 67 |
| 1,2-Dichlorobenzene | 3/13 | 10 | 11 |
| 1,2,4-Trichlorobenzene | 3/13 | 1,420 | 2,200 |

NOTES:

1. Frequency of detection is the number of samples taken from different locations in which the compound was detected divided by the number of samples for which the compound was analyzed (including blanks and duplicates).

2. Arithmetic average concentration is calculated only for the samples where the compound was detected.

3. Compounds not listed were not detected or not considered site-related.

4. All samples unfiltered unless noted.

* Glass Filtration
** Paper Filtration

# TABLE 8
# BEDROCK AQUIFER
# GROUNDWATER CONTAMINANT CONCENTRATIONS
# NORWOOD PCB SITE

| Compound | Frequency Of Detection | Concentration (ug/l) Average Detection | Concentration (ug/l) Maximum Detection |
|---|---|---|---|
| **PHASE I RESULTS** | | | |
| **PCBs** | | | |
| Aroclor-1254 | 2/14 | 6.4 | 8 |
| **Chlorinated Aliphatics** | | | |
| Vinyl chloride | 3/14 | 23 | 65 |
| 1,2-Dichloroethene (total) | 3/14 | 44 | 68 |
| Trichloroethene | 2/14 | 1,250 | 1,300 |
| **Total VOCs** | 9/14 | 308 | 1,356 |
| PHASE II RESULTS | | | |
| **PCBs** | | | |
| Aroclor-1254 | 2/12 | 2.4 | 2.7 |
| *Aroclor-1254 | 0/12 | 0 | 0 |
| Chlorinated Aliphatics | | | |
| Vinyl Chloride | 1/12 | 110 | 110 |
| 1,2-Dichloroethene(total) | 3/12 | 43 | 110 |
| Trichloroethene | 1/12 | 1,400 | 1,400 |
| **Total VOCs** | 4/12 | 410 | 1,510 |
| **Chlorobenzenes** | | | |
| Chlorobenzene | 1/12 | 2 | 2 |

NOTES: See Table 7.

# Table 9

## SUMMARY OF THE ENDANGERMENT ASSESSMENT
## CHEMICALS OF POTENTIAL CONCERN
## NORWOOD PCB SITE
## REMEDIAL INVESTIGATION REPORT

| Chemical | Surface Soil | Subsurface Soil | Ground Water | Surface Water | Sediment | Dredge Piles |
|---|---|---|---|---|---|---|
| Benzoic Acid | X | X | | | | |
| Chlorobenzene | | X | X | | | |
| Chloroform | X | X | | X | X | X |
| 1,2-Dichlorobenzene | | X | X | | | |
| 1,3-Dichlorobenzene | | X | X | | | |
| 1,4-Dichlorobenzene | | X | X | | | |
| 1,1-Dichloroethene | X | | | X | | |
| 1,2-Dichloroethane | X | X | | | | |
| 1,2-Dichloroethenes (total) | | X | X | X | | |
| Phenol | X | X | | | X | |
| PCBs | X | X | X | | X | X |
| Carcinogenic PAHs | X | X | | | X | X |
| Noncarcinogenic PAHs | X | X | | | X | X |
| 1,1,2,2-Tetrachloroethane | | X | X | X | | |
| Tetrachloroethene | X | X | X | X | | |
| 1,2,4,-Trichlorobenzene | X | X | X | | X | |
| 1,1,1-Trichloroethane | X | | X | X | | |
| 1,1,2-Trichloroethane | X | X | X | | | |
| Trichloroethene | X | X | X | X | | |
| Vinyl chloride | | X | X | | | |
| Silver | X | | X | | X | |
| Zinc | X | | | | X | X |

## TABLE 10

## SUMMARY OF POTENTIAL RISKS ASSOCIATED WITH THE NORWOOD PCB SITE

| | Total Upperbound Lifetime Excess Cancer Risk | | Noncarcinogenic Hazard Index | |
|---|---|---|---|---|
| | Average | Plausible Maximum | Average | Plausible Maximum |
| **Current land-use** | | | | |
| Worker contact with surface soil in the vicinity of the Grant Gear Facility | 1E-05 | 8E-03 | <1 | <1 |
| Worker contact with equipment surfaces and indoor walls of the Grant area of the Grant Gear facility | 2E-05 | 5E-05 | NC | NC |
| Inhalation of indoor air by workers at the Grant Gear facility | 2E-05 | NA | <1 | NA |
| Landscape worker contact with surface soil at Kerry Place, the Hyundai Dealer and other commercial properties south and east of Grant Gear | 2E-07 | 2E-06 | <1 | <1 |
| Children contacting soil and dredge piles in the wooded area north of the Grant Gear facility | 2E-06 | 6E-04 | <1 | <1 |
| Residents contacting soil in yards north of Meadow Brook | 2E-07 | 3E-06 | <1 | <1 |
| Children contacting surface water and sediment in Meadow Brook | 3E-06 | 5E-05 | <1 | <1 |
| **Future land-use** | | | | |
| Residential contact with soil at the Grant Gear Facility of the wooded area north and east of Grant Gear | 5E-05 | 3E-02 | <1 | <1 |
| Residential contact with soil in the vacant lot | 9E-07 | 2E-04 | <1 | <1 |
| Inhalation by residents at the Grant Gear Facility and the wooded area north and east of Grant Gear | 9E-05 | NA | <1 | NA |
| Inhalation by residents at the vacant lot | 5E-07 | NA | <1 | NA |
| Ingestion of groundwater | 1E-03 | 4E-02 | <1 | >1 |

NA = Not applicable; only average air concentrations were used in the evaluation

NC = Not calculated; only carcinogenic risks associated with PCBs were determined

## TABLE 11
## SUMMARY OF ALTERNATIVE SCREENING
## NORWOOD PCB SITE

| Pre-Screening Alternative | Description | Results of Screening | New Alternative No. |
|---|---|---|---|
| SC-1 | No-Action | Retained | SC-1 |
| SC-2 | Capping | Retained 2 options<br>A: Cap site soils > 10 ppm, sediments > 10 ppm, and northern site soils > 1 ppm.<br>B. Cap site soils > 10 ppm sediments > 1 ppm, and northern site soils > 1 ppm. | SC-2 |
| SC-3 | Line Stream | Eliminated as an individual alternative. Will be kept as option with all SC alternatives except SC-1. | -- |
| SC-4 | Solvent Extraction: TEA | Retained | SC-3 |
| SC-5 | Dechlorination: KPEG | Retained | SC-4 |
| SC-6 | Onsite Incineration | Retained | SC-5 |
| SC-7 | Offsite Incineration | Eliminated | -- |
| SC-8 | Offsite Landfilling | Eliminated as individual alternative. Maintained as option for sediments with SC-2. | -- |
| MM-1 | No Action | Retained | MM-1 |
| MM-7 | Air Stripping | Retained | MM-2 |
| MM-3 | Carbon Adsorption | Retained | MM-3 |
| MM-4 | UV/Oxidation | Retained | MM-4 |

## TABLE 12
## SUMMARY OF DETAILED ANALYSIS - SOURCE CONTROL (SC) REMEDIAL ALTERNATIVES
## NORWOOD PCB SITE FEASIBILITY STUDY

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Major Components | - Construction of site perimeter fence.<br>- Implement institutional restrictions.<br>- Perform long-term environmental monitoring. | - Construct a new perimeter fence.<br>- Impose institutional restrictions.<br>- Conduct public education programs.<br>- Regrade dredge piles.<br>- Excavate and place outlying materials.<br>- Backfill and restore outlying areas.<br>- Restore wetlands areas.<br>- Construct asphalt cap and restore existing pavement.<br>- Perform long-term site environmental monitoring.<br>- Optional lining of stream channel. | - Construct site fence.<br>- Clear and grub site.<br>- Excavate and stockpile solids and sediment.<br>- Treatment via BEST process.<br>- Offsite incineration of extracted PCB oils.<br>- Replace treated solids onsite.<br>- Backfill and restore outlying areas.<br>- Restore wetlands areas.<br>- Revegetate and repave.<br>- Optional lining of stream channel. | - Construct site fence.<br>- Clear and grub site.<br>- Excavate and stockpile solids and sediment.<br>- Treatment via KPEG process.<br>- Replace treated solids onsite.<br>- Backfill and restore outlying areas.<br>- Restore wetlands areas.<br>- Revegetate and repave.<br>- Optional lining of stream channel. | - Construct site fence.<br>- Clear and grub site.<br>- Excavate and stockpile solids and sediment.<br>- Incinerate solids.<br>- Replace incinerated solids onsite.<br>- Backfill and restore outlying areas.<br>- Restore wetlands areas.<br>- Revegetate and repave.<br>- Optional lining of stream channel. |
| Short-Term Effectiveness | | | | | |
| Protection of Community | No net increase in risk to community during implementation. | The public would be at increased risk compared to SC-1 during soil and sediment excavation. | Risks of direct contact with soils and sediments during excavation and onsite storage of PCB oils from the treatment prior to offsite disposal. | Risks of direct contact with soils and sediments during excavation. Risks associated with treatment are believed minimal. | Risks of direct cont with soils and sedim during excavation. Additional increase airborne contaminant from thermal treatm unit emissions. Im largely mitigated by emissions treatment. |

Table 12 (Continued)
Page 2

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Protection of Workers | Protection required during installation of site fence. | Workers would be required to use "Level C" personal protective equipment and respiratory protection equipment. | Workers would be required to use "Level C" personal protective equipment and respiratory protection equipment; treatment system operated by vendors trained personnel. | Same as Alternative SC-4. | Same as Alternative SC-4. |
| Environmental Impacts | Minor impacts due to tree cutting during fence implementation | May result in a short-term adverse environmental impact caused by clearing and grubbing in the central zone and during the excavation and consolidation of outlying soil areas and sediment under the cap. Wetlands areas would be disturbed during excavation. | Potential mobilization of soils and sediments during excavation; TEA has a strong ammonia-like odor. Wetlands areas would be disturbed during excavation. | Potential mobilization of soils and sediments during excavation. Wetlands areas would be disturbed during excavation. | Potential mobilizatio of soils and sediment during excavation plu additional impacts du to low-level emission from incineration. Wetlands areas would disturbed during excavation. |
| Time to Achieve Protection | Reduction in the current risks of direct contact could be achieved within 1 year; risks from future ground water ingestion and direct contact would remain. | Reduction in risks addressed could be achieved within 2-1/2 years of the start of the remedial design. | Reduction in risks addressed could be achieved within 4 years of the start of the remedial design. | Reduction in risks addressed could be achieved within 4½ years of the start of the remedial design. | Reduction in risks addressed could be achieved within 4 yei of the start of the remedial design. |

le 13. (Continued)
age 3

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Magnitude of Residual Risks | Significant residual risks remain, since containment or treatment technologies are not employed. Risks remain as identified in the EA. | Potential exists for exposure to contaminated solids and leaching of contained material to ground water if cap fails. | Residual risk of untreated volume dependent on selected cleanup level. Less than 10 ppm PCB in residual; Long-term management required for saturated soils. | Residual risk of untreated volume dependent on selected cleanup level. Less than 10 ppm PCB in residual; Long-term management required for saturated soils. | Residual risk of untreated volume dependent on selected cleanup level. Treatment residual is assumed to pass leaching requirements. Additional treatment would be required for inorganics if leaching limits were exceeded. Long-term management required for saturated soils. |
| Adequacy of Controls | No direct engineering controls to prevent exposure to contaminated solids; fence is susceptible to vandalism; inspections and reviews required. Monitoring will track but not remediate contamination. | Non-RCRA cap will reduce potential for direct contact with soils and sediments; leaching to ground water reduced. Capping requires regular inspection and maintenance. Monitoring will track but not remediate contamination. | Solvent extraction is an innovative technology; treatability study is required; compatible with flood control requirements in Meadow Brook. Monitoring needed to verify treatment effectiveness. | Dechlorination is an innovative technology; treatability study is required; compatible with flood control requirements in Meadow Brook. Monitoring needed to verify treatment effectiveness. | Thermal treatment is a proven technology to destroy organics; long-term management of residuals may be required. Compatible with flood control requirements in Meadow Brook. Monitoring needed to verify treatment effectiveness. |

le 12 (continued)
age 4

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Reliability | Sole reliance on fence and institutional controls to prevent exposure; high level of residual risk. Further degradation of ground water likely.<br>Long-term monitoring required. | Likelihood of failure is low as long as O & M is performed; risks from direct contact and inhalation of VOCs is reduced; further degradation of ground water is possible.<br>Long-term monitoring required. | Remedy will be highly reliable due to removal of organics from soils and sediments.<br>Monitoring needed to verify treatment performance.<br>No long-term maintenance required.<br>Long-term monitoring of saturated soils required. | Remedy will be highly reliable due to removal of organics from soils and sediments.<br>Monitoring needed to verify treatment performance. Treatment residuals are not toxic.<br>No long-term maintenance required.<br>Long-term monitoring of saturated soils required. | Remedy will be highly reliable due to destruction of organics from soils and sediments. Monitoring needed to verify treatment performance.<br>No long-term maintenance required.<br>Long-term monitoring of saturated soils required. |
| Reduction of Toxicity, Mobility and Volume | No reduction in mobility, toxicity, or volume of wastes. | Reduction in contaminant mobility due to reduction of infiltration. No reduction in toxicity or volume. | Significant reduction in contaminant volume and in toxicity by destruction of treatment oil concentrate. May increase mobility of PCBs in residuals. | Significant reduction in contaminant volume and toxicity by destruction of PCBs and chlorinated organics. May increase mobility of PCBs in residuals. | Significant reduction in contaminant volume and toxicity by destruction of PCBs and organics. May increase mobility of inorganics in residuals. |
| Implementability | | | | | |
| Technical Feasibility | All components easily implemented. | Wetlands restoration may be difficult. | Solvent extraction is an innovative technology requiring special equipment and operators. Has been demonstrated on other sites to achieve sufficient reduction in initial concentration to achieve target level.<br>Wetlands restoration may be difficult. | Dechlorination is an innovative technology requiring special equipment and operators. Has been demonstrated on other sites to achieve sufficient reduction in initial concentration to achieve target level.<br>Wetlands restoration may be difficult. | Incineration requires special equipment and operators. Has been demonstrated on other sites to achieve 99.9999% destruction of PCBs.<br>Wetlands restoration may be difficult. |

Table 12 (Continued)
Page 5

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Administrative Feasibility | Long-term coordination between EPA and State required for monitoring. | Long-term coordination between EPA and State-required for excavation, wetlands restoration and monitoring. | Same as Alternative SC-2 for excavation and wetlands restoration, requires offsite transport and incineration of treatment oil concentrate, does not require long-term coordination. | Same as Alternative SC-2 for excavation and wetlands restoration, does not require long-term coordination. | Same as Alternative SC-2 for excavation and wetlands restoration, does not require long-term coordination. |
| Availability of Services | Services and materials locally available. | Services and materials regionally available. | Solvent extraction equipment is available from a few national sources, incineration services are available in eastern region for treatment of oil residues. Remainder of components same as Alternative SC-2. | Dechlorination equipment is available from one commercial source. Remainder of components same as Alternative SC-2. | Mobile incinerators and operators are available from a number of sources nationally. Remainder of components same as Alternative SC-2. |
| Cost | Refer to Table 6-17 for Cost Summary. | Refer to Table 6-17 for Cost Summary. | Refer to Table 6-17 for Cost Summary. | Refer to Table 6-17 for Cost Summary. | Refer to Table 6-17 for Cost Summary. |

Table 12 (Continued)
Page 6

| Assessment Factors | Alternative SC-1 Minimal No-Action | Alternative SC-2 Capping | Alternative SC-3 Solvent Extraction: TEA | Alternative SC-4 Dechlorination: KPEG | Alternative SC-5 Onsite Incineration |
|---|---|---|---|---|---|
| Compliance with ARARs | RCRA closure/ post-closure requirements will not be met. ARARs for ground water will not be attained. | Excavation performed in wetland. Waste material will be removed from flood plain. RCRA closure/post-closure requirements met. ARARs for ground water may not be attained dependent upon selected MM alternative. | Same as Alternative SC-2. | Same as Alternative SC-2. | Same as Alternative SC-2. |
| Overall Protection | Risk of direct contact and inhalation controlled by fence; continued degradation of ground water quality will occur. | Risk of direct contact with soils and sediments controlled by non-RCRA cap; risk of VOC inhalation controlled by reducing volatilization; provides protection to aquatic life compared to SC-1; potential remains for continued ground water and surface water degradation. | Risk of direct contact with soils and sediments controlled; risk of VOC inhalation controlled by reducing volatilization; provides equal protection to aquatic life compared to SC-2; Potential remains for continued ground water degradation, due to contaminants below groundwater table. | Risk of direct contact with soils and sediments controlled; risk of VOC inhalation controlled by reducing volatilization; provides equal protection to aquatic life compared to SC-3; Potential remains for continued ground water degradation, due to contaminants below groundwater table. | Risk of direct contact with soils and sediments controlled; risk of VOC inhalation controlled by reducing volatilization; provides equal protection of aquatic life as SC-3; Potential remains for continued ground water degradation, due to contaminants below groundwater table. |
| State Acceptance | To be addressed following public comment period. | | | | |
| Community Acceptance | To be addressed following public comment period. | | | | |

# TABLE 13
# SUMMARY OF DETAILED ANALYSIS - MANAGEMENT OF MIGRATION (MM) REMEDIAL ALTERNATIVES
## NORWOOD PCB SITE FEASIBILITY STUDY

| Assessment Factors | Alternative MM-1 Minimal No-Action | Alternative MM-2 Air Stripping | Alternative MM-3 Carbon Adsorption | Alternative MM-4 UV/Oxidation |
|---|---|---|---|---|
| Major Components | · Obtain land use/deed restrictions<br>· Implement institutional restrictions on future water usage<br>· Conduct public education programs, including public meetings and presentations, to increase public awareness<br>· Perform groundwater, surface water, sediment, and air monitoring to monitor contaminant concentrations and migration<br>· Perform site review every five years | · Shallow/bedrock collection and extraction system<br>· Activated carbon bed<br>· Air stripping with vapor phase controls<br>· Precipitation/filtration.<br>· Groundwater recharge system.<br>· Perform site review every five years. | · Shallow/bedrock collection and extraction system<br>· Activated carbon bed<br>· Granular Activated Carbon<br>· Precipitation/filtration.<br>· Groundwater recharge system.<br>· Perform site review every five years. | · Shallow/bedrock collection and extraction system<br>· UV/Oxidation unit<br>· Precipitation/filtration.<br>· Groundwater recharge system.<br>· Perform site review every five years. |
| Short-Term Effectiveness | | | | |
| Protection of Community | No significant increase in risks during implementation | Slight increase in risk associated with the installation of extraction and recharge system, treatment system has potential to release VOCs if failure occurs. | Slight increase in risk associated with the installation of extraction and recharge system, and offsite regeneration or disposal of spent carbon. | Slight increase in risk associated with the installation of extraction and recharge system, treatment system may produce sludge for offsite transport and disposal. |
| Protection of Workers | Protection of workers required during monitoring well installation. | Protection required during installation of extraction/recharge system and monitoring system. | Protection required during installation of extraction/recharge system and monitoring system. | Protection required during installation of extraction/recharge system and monitoring system. |
| | Minor impacts associated with installation of monitoring system. | | | |
| Environmental Impacts | If institutional controls effective within one year of start of remedial design, reduction in potential for groundwater ingestion. | Minor impacts associated with installation of extraction/recharge system and monitoring system. | Minor impacts associated with installation of extraction/recharge system and monitoring system. | Minor impacts associated with installation of extraction/recharge system and monitoring system. |
| Time to Achieve Protection | Significant future residual risks remain, since containment or treatment is not performed. Risks remain as presented in the EA. | Construction and implementation could be achieved within two years start of remedial design. Risks associated with VOCs removed from aquifers within 8 to 24 years. Residual risks from PCBs in aquifers will remain for many years. | Construction and implementation could be achieved in less than two years of start of remedial design. Risks associated with VOCs removed from aquifers within 8 to 24 years. Residual risks from PCBs in aquifers will remain for many years. | Construction and implementation could be achieved less than two years of start remedial design. Risks associated with VOCs removed from aquifers within 8 to 24 years. Residual risks from PCBs in aquifers will remain for many years. |

Table 13
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| Assessment Factors | Alternative MM-1 Minimal No-Action | Alternative MM-2 Air Stripping | Alternative MM-3 Carbon Adsorption | Alternative MM-4 UV/Oxidation |
|---|---|---|---|---|
| Adequacy of Controls | No direct engineering controls to prevent exposure; dependent on land use and deed restrictions. Long-term monitoring required. | Monitoring and maintenance of collection/treatment/recharge system required to maintain effectiveness. | Monitoring and maintenance of collection/treatment/recharge system required to maintain effectiveness. | Monitoring and maintenance of collection/treatment/recharge system required to maintain effectiveness. |
| Reliability | Sole reliance on institutional controls to reduce exposure. High level of residual risk. Near-term reliability good, long-term unknown. | Likelihood of failure low if proper O&M performed. Pilot testing used to design system, monitoring performed to evaluate effectiveness. | Likelihood of failure low if proper O&M performed. Pilot testing used to design system, monitoring performed to evaluate effectiveness. | Likelihood of failure low if proper O&M performed. Pilot testing used to design system, monitoring performed to evaluate effectiveness. |
| Reduction of Toxicity, Mobility and Volume | No reduction in mobility, toxicity, or volume. PCBs move very slowly in aquifers; VOCs move more rapidly. | Significant reduction in contaminant toxicity of extracted groundwater and reduction of contaminant volume in groundwater. | Significant reduction in contaminant toxicity of extracted groundwater and reduction of contaminant volume in groundwater. | Significant reduction in contaminant toxicity of extracted groundwater and reduction of contaminant volume in groundwater. |
| Implementability | | | | |
| Technical Feasibility | All components easily implemented. | Relatively uncomplicated to implement. | Relatively uncomplicated to implement. | UV/oxidation is an innovative technology, will require pilot testing to verify design and performance characteristics. |
| Administrative Feasibility | Would require long-term coordination between State and EPA for adequate monitoring and evaluation of need to expand institutional controls. | Same as MM-1 with addition of meeting State drinking water standards and criteria for recharge to groundwater. | Same as MM-1 with addition of meeting State drinking water standards and criteria for recharge to groundwater. | Same as MM-1 with addition of meeting State drinking water standards and criteria for recharge to groundwater. |
| Availability of Services | Services and materials available locally. | Services and materials available in New England. | Services and materials available in New England. | Most services and materials available in New England. Limited number of vendors of UV/oxidation treatment units in nation. |
| Cost | | | | |
| Capital | $78,000 | $1,018,000 | $ 934,000 | $1,047,000 |
| 10-Year P.W (5%) | $967,000** | $2,501,000 | $2,326,000 | $2,854,000 |

**30 year P.W(5%)

| Assessment Factors | Alternative MM-1<br>Minimal No-Action | Alternative MM-2<br>Air Stripping | Alternative MM-3<br>Carbon Adsorption | Alternative MM-4<br>UV/Oxidation |
|---|---|---|---|---|
| Compliance with ARARs | Will not meet Groundwater Protection Criteria; contaminant-specific ARARs for groundwater not attained. | Action-specific ARARs attained. Contaminant-specific ARARs attained for VOCs within 10 years. | Action-specific ARARs attained. Contaminant-specific ARARs attained for VOCs within 10 years. | Action-specific ARARs attained. Contaminant-specific ARARs attained for VOCs within 10 years |
| Overall Protection | Minimal level of protection by limiting future use and development of the groundwater. | Future risks mitigated by the collection and treatment of contaminants from the groundwater aquifers. Time to achieve these goals is about 10 years and is limited by the chemical properties of contaminants and aquifer properties which prevent effective extraction. | Future risks mitigated by the collection and treatment of contaminants from the groundwater aquifers. Time to achieve these goals is about 10 years and is limited by the chemical properties of contaminants and aquifer properties which prevent effective extraction. | Future risks mitigated by the collection and treatment of contaminants from the groundwater aquifers. Time to achieve these goals is about 10 years and is limited by the chemical properties of contaminants and aquifer properties which prevent effective extraction. |
| State Acceptance | To be addressed following public comment period. | | | |
| Community Acceptance | To be addressed following public comment period. | | | |

## TABLE 14

## Assumptions Used In Calculating Soil Target Clean Levels

### A. Soils at Grant Gear and Surrounding Commercial Properties

| Parameter | Exposure Conditions |
|---|---|
| Frequency of Exposure | 100 events/years |
| Years of Exposure | 20 years |
| Average Body Weight Over Exposure Period | 70 kg |
| Soil Contact Rate | 500 mg/event |
| Dermal Absorption Factors: | |
| inorganics | Negligible |
| noncarcinogenic PAHs | 0.05 |
| carcinogenic PAHs | 0.05 |
| PCBs | 0.05 |
| benzoic acid | 0.5 |
| Quantity of Soil Ingested | 100 mg/exposure event |
| Oral Absorption Factors: | |
| inorganics | 1.0 |
| PCBs & PAHs | 0.3 |
| other organics | 1.0 |

Table 14 Continued

**B. Soils and Dredge Piles Between Grant Gear's Northern Fence and Meadow Brook, and Residential Properties North of Meadow Brook**

| Parameter | Exposure Conditions |
|---|---|
| Frequency of Exposure | 100 events/year |
| Years of Exposure | 70 years |
| Average Weight Over Exposure Period | 70 kg |
| Average Soil Contact Rate Over Exposure Period | 500 mg/event |
| Dermal Absorption Factors: | |
| PCBs | 0.05 |
| noncarcinogenic | 0.05 |
| carcinogenic PAHs | 0.05 |
| benzoic acid | 0.5 |
| chloroform | 0.5 |
| volatile organics | 0.5 |
| Average Quantity of Soil Ingested Over Exposure Period | 100 mg/event |
| Oral Absorption Factors: | |
| inorganics | 1.0 |
| PCBs & PAHs | 0.3 |
| other organics | 1.0 |

## Table 15

### Summary of Soil Component

| | Section A | Section B | |
|---|---|---|---|
| | Area north of Grant Gear northern fence and adjacent to Meadow Brook including residential properties | Areas within Grant Gear property and surrounding commercial properties | Meadow Brook Sediments |
| Excavation Action Levels | 1 ppm PCBs<br>2 ppm total carcinogenic PAHs | 10 ppm PCBs<br>6 ppm carcinogenic PAHs<br>(25 ppm PCBs for commercial properties outside Grant Gear) | 1 ppm PCBs |
| Solvent Extraction Treatment Action Levels | 10 ppm PCBs<br>6 ppm carcinogenic PAHs | 10 ppm PCBs<br>6 ppm carcinogenic PAHS | 10 ppm PCBs<br>6 ppm carcinogenic PAHs |
| Backfilling Requirements | Clean Fill<br>Topsoil<br>Revegatation | All treated soils<br>Untreated soils with <10 ppm PCBs and <6 ppm PAHs<br>10 inch soil cover clean fill revegatation /repavement | Wetlands Restoration |

## TABLE 16
## CHEMICAL-SPECIFIC ARARS AND CRITERIA, ADVISORIES, AND GUIDANCE
## NORWOOD PCB SITE
## NORWOOD, MASSACHUSETTS

| MEDIUM/AUTHORITY | REQUIREMENT | STATUS | REQUIREMENT SYNOPSIS | ACTION TAKEN TO ATTAIN ARARS |
|---|---|---|---|---|
| Ground Water | | | | |
| Federal Regulatory Requirements | SDWA-Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16) | Relevant and Appropriate | MCLs have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for ground water aquifers potentially used for drinking water. | Treatment will be conducted to achieve SDWA MCLs in groundwater. |
| | RCRA - Subpart F Releases from Solid Waste Management Units (40 CFR 264.90 - 264.101) | Relevant and Appropriate | RCRA MCLs provide groundwater protection standards for 14 common contaminants. All are equal to the SDWA MCLs for those contaminants. | Treatment will be conducted to achieve RCRA MCLs in groundwater. |
| State Regulatory Requirements Standards | DEP - Massachusetts Groundwater Quality Standards (314 CMR 6.00) | Applicable | Massachusetts Groundwater Quality Standards have been promulgated for a number of contaminants. When the state levels are more stringent than federal levels, the state levels will be used. | DEQE groundwater standards were considered when determining clean-up levels and discharge limits for treated groundwater. |
| | Groundwater Discharge Permit Program (314 CMR 5.00) | Relevant and Appropriate | The standards applying to site contaminants are generally equivalent to Massachusetts Drinking Water Standards. | DEQE groundwater standards were considered when determining clean-up levels and discharge limits for treated groundwater. |
| | DEP - Drinking Water Standards (310 CMR 22.00) | Relevant and Appropriate | The Massachusetts Drinking Water Guidelines and Standards include Massachusetts Maximum Contaminant Levels (MMCLs) which are the MCL values established by EPA and adopted by the state and MCLs which have been established for any of the contaminants of concern in groundwater; therefore, the MCLs were used to establish target levels. | Since some DEP drinking water standards are the same as MCLs, promulgated MCLs were used to set clean-up levels for contaminants of concern including vinyl chloride and trichloroethene. Groundwater target cleanup levels for tetrachloroethene and 1,4-dichlorobenzene were based on the State drinking water standards. |

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Page Two

| MEDIUM/AUTHORITY | REQUIREMENT | STATUS | REQUIREMENT SYNOPSIS | ACTION TAKEN TO ATTAIN ARARS |
|---|---|---|---|---|
| Federal Criteria, Advisories, and Guidance | SDWA - Maximum Contaminant Level Goals (MCLGs) | To be Considered | MCLGs are health-based criteria that are to be considered for drinking water sources as a result of SARA. These goals are available for a number of organics and inorganic contaminants. | Projected groundwater concentrations of copper, trans-1,2-dichloroethene, toluene, benzene, and TCE were compared to their MCLGs. For benzene and TCE, MCLGs are set at zero. |
| | EPA Carcinogen Assessment Group Potency Factors | To be Considered | Potency Factors are developed by the EPA from Health Effects Assessments or evaluation by the Carcinogenic Assessment Group. | EPA Carcinogenic Potency Factors were used to compute the individual incremental cancer risk resulting from exposure to site contaminants, vinyl chloride, benzene, PCBs, DEHP, N-nitrosodiphenylamine, and trichloroethene. |
| | Health Advisories (EPA Office of Drinking Water) | To be Considered | Health Advisories are estimates for risk due to consumption of contaminated drinking water; they consider noncarcinogenic effects only. | Health advisories were considered for contaminants in groundwater that may be used for drinking water. |
| | EPA Risk Reference Doses (RfDs) | To be Considered | RfDs are dose levels developed by the EPA for noncarcinogenic effects. | EPA RfDs were used to characterize risks due to exposure to contaminants in ground water, as well as other media. They were considered for noncarcinogens including toluene, 2-butanone, n-dibutylphthalate, acetate, mercury, and thallium. |
| | EPA Office of Water Guidance - Water-Related Fate of 129 Priority Pollutants (1979) | To be Considered | This guidance manual gives transport and fate information for 129 priority pollutants. | The manual was used to assess the transport and fate of a variety of contaminants. |
| State Criteria, Advisories, and Guidance | Massachusetts Drinking Water Health Advisories | To be Considered | DEP Health Advisories are guidance criteria for drinking water. | DEP Health Advisories were considered when developing action levels for ground water. |

Table 16
Page Three

| MEDIUM/AUTHORITY | REQUIREMENT | STATUS | REQUIREMENT SYNOPSIS | ACTION TAKEN TO ATTAIN ARARS |
|---|---|---|---|---|
| Surface Water | | | | |
| Federal Criteria, Advisories, and Guidance | Application of Equilibrium Partitioning Approach to the Establishment of Sediment Quality Criteria | To be Considered | This guidance is used to establish criteria to protect the aquatic organisms in streams and to determine environmental risks. | The criteria established was used to evaluate risks to aquatic organisms exposed to contaminated water entrained within the sediments and to set sediment cleanup levels. |
| | Federal Ambient Water Quality Criteria (AWQC) | To be Considered | Federal AWQC are criteria for protection of human health and aquatic organisms which have been developed for 95 carcinogenic and noncarcinogenic compounds.<br>AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards. A more stringent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site. | AWQC were used to characterize risks to fresh water aquatic life in Meadow Brook. The PCB cleanup level for the Grant Gear drainage system was established to protect aquatic life. |

TABLE 17
LOCATION-SPECIFIC ARARS AND CRITERIA, ADVISORIES, AND GUIDANCE
NORWOOD PCB SITE
NORWOOD, MASSACHUSETTS

| MEDIUM/AUTHORITY | REQUIREMENT | STATUS | REQUIREMENT SYNOPSIS | ACTION TAKEN TO ATTAIN ARARS |
|---|---|---|---|---|
| Wetlands/Floodplains | | | | |
| Federal Regulatory Requirements | Clean Water Act (CWA) - Section 404 Dredge and Fill Requirements | Applicable | Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative that has less effect is available. | Impacts to the wetlands will be mitigated by use of silt curtains or sedimentation basins. A wetlands restoration program will also be implemented. |
| | RCRA Location Standards (40 CFR 264.18) | Relevant and Appropriate | This regulation outlines the requirements for constructing a RCRA facility on a 100-year floodplain. | It is assumed that remediation facilities will be located outside floodplains. Temporary staging areas or remediation facilities that are located in a floodplain will be designed to allow quick mobilization out of the area and to prevent damage caused by initial floodwaters. |
| | National Ambient Air Quality Standards (40 CFR Part 50) | Relevant and Appropriate | Federal agencies required to determine if the site is located within a nonattainment area for ozone. | Remediation of sites within nonattainment areas must consider the ozone attainment status in designing remediation systems. |
| | Wetlands Executive Order (EO 11990) | Applicable | Under this regulation, Federal agencies are required to minimize the destruction, loss or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. | Remedial alternatives that involve construction must include all practicable means of minimizing harm to wetlands. Wetlands protection considerations must be incorporated into the planning and decision-making about remedial action. |
| | Floodplains Executive Order (EO 11988) | Applicable | Federal agencies are required to reduce the risk of flood loss, to minimize impact of floods, and to restore and preserve the natural and beneficial values of floodplains. | The potential effects of any action must be evaluated to ensure that the planning and decision-making reflect consideration of flood hazards and floodplain management, including restoration and preservation of natural, undeveloped floodplains.Table<br>(Continued)<br>Page Two |

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| MEDIUM/AUTHORITY | REQUIREMENT | STATUS | REQUIREMENT SYNOPSIS | ACTION TAKEN TO ATTAIN ARARS |
|---|---|---|---|---|
| State Regulatory Requirements | DEP - Wetlands Protection (310 CMR 10.00) | Applicable | These regulations are promulgated under Wetlands Protection Laws, which regulate dredging, filling altering, or polluting inland wetlands. Work within 100 feet of a wetland is regulated under this requirement. The requirement also defines wetlands based on vegetation type and requires that effects on wetlands be mitigated. | The alternative will meet appropriate performance standards for activities in the wetlands. |

## TABLE 18
## ACTION-SPECIFIC ARARS FOR ALTERNATIVE MM-2
## AIR STRIPPING
## NORWOOD PCB SITE

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| OSHA-General Industry Standards (29 CFR 1910)[1] | These regulations specify the 8-hr. time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 9910.120. | Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations. |
| OSHA-Safety and Health Standards (29 CFR 1926)[1] | This regulation specifies the type of safety equipment and procedures to be followed during site remediation. | All appropriate safety equipment will be on site and appropriate procedures will be followed during treating activities. |
| Resource Conservation and Recovery Act (RCRA), RCRA Subtitle C, 42 U.S.C. § 6921 et seq. | RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 121(d)(3)) that hazardous substances from response actions be disposed of at facilities in compliance with Subtitle C of RCRA. | All off-site disposal facilities activities will be in compliance with RCRA. |
| OSHA-Recordkeeping, Reporting and Related Regulations (29 CFR 1904)[1] | This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA. | These regulations apply to the company(s) contracted to install, operate, and maintain the treatment unit. |
| USEPA Groundwater Protection Strategy - USEPA Policy Statement, August 1984[3] | Identifies groundwater quality to be achieved during remedial actions based on the aquifer characteristics and use. | Aquifer characteristics and use will be taken into consideration when designing a water treatment system. |
| DEP - Standards for Owners and Operators of Permitted Hazardous Waste Facilities (310 CMR 30.510-516)[2] | General facility requirements outline general waste analysis, security measures, inspections, and training requirements. | Facility will be designed, constructed, and operated in accordance with this requirement. All workers will be properly trained. |
| DEP - Contingency Plan, Emergency Procedures, Preparedness and Prevention (310 CMR 30.520-524)[2] | This regulation outlines requirements for safety equipment and spill control. | Safety and communication equipment will be installed at the site. Local authorities will be familiarized with the site. |
| DEP - Groundwater Protection (310 CMR 660-675)[2] | This regulation details requirements for a groundwater monitoring program to be implemented at the site. | A groundwater monitoring program will be designed, installed, and treated to assess success of groundwater treatment. |

Table 18
Page Two

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| DEP - Closure and Post-Closure (310 CMR 30.580 - 595)[2] | This regulation details specific requirements for closure and post-closure of hazardous waste facilities. | Since groundwater will be cleaned to drinking water standards, post-closure standards will be met. Full compliance will depend on which source control option is utilized. |
| DEP - Hazardous Waste Regulations, Phase I and II (310 CMR 30.00)[2] | This regulation provides a comprehensive program for the handling, storage and recordkeeping at hazardous waste facilities. This regulation operates supplements RCRA regulations. | All handling, storage, and recordkeeping executed at the site will be performed in a manner consistent with regulations. |
| Proposed Standards for Control of Emissions of Volatile Organics - 52 FR 3748 (February 5, 1987)[3] | Prescribes proposed standards for VOC emissions from units such as air strippers. | Air treatment equipment will be designed, constructed, and operated in tandem with air-stripping units. |
| Fish and Wildlife Coordination Act 16 USC661 et. seq.[1] | This act requires that before undertaking any Federal action that causes the modification of any body of water or affects fish and wildlife, the following agencies must be consulted: the appropriate State agency exercising jurisdiction over Wildlife Resources and the U. S. Fish and Wildlife Service. | If it is determined that the alternative will cause a modification of a body of water, the U. S. Fish and Wildlife Service will be notified. |
| DEP - Wetlands Protection (310 CMR 10.00)[1] | This regulation outlines the requirements necessary to work within 100 feet of a coastal or inland wetland. | All work done within the regulated wetlands areas will be performed so as to minimize the adverse effects on wetlands, if possible. |
| CWA - Disposal of Dredged or Fill Material (40 CFR 230)[1] | Regulates the discharge of dredged material to control the impacts on wetlands. | Work will be performed in a manner that minimizes the adverse effects on wetlands. |
| Standards Applicable to Transporters of Hazardous Waste - RCRA Section 3003, 40 CFR 262 and 263, 40 CFR 170 to 179[1] | Establishes the responsibility of offsite transporters of hazardous waste in the handling, transportation, and management of the waste. Requires a manifest, record keeping, and immediate action in the event of a discharge of hazardous waste. | This regulation will be applicable to any company contracted to transport hazardous material from the site (vapor phase carbon; PCB-contaminated liquids; metal sludge). |

Table 18
Page Three

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| TSCA - Disposal Requirements (40 CFR 761.60)[1] | Establishes treatment and disposal standards for PCB items and PCBs in soils and liquids for all alternatives which include the disturbance of PCB-contaminated soil and generate PCB-contaminated liquids. | If soils removed during implementation of the collection and recharge system are contaminated with PCBs regulated by TSCA those soils will be treated or disposed in compliance with TSCA. Sacrificial carbon bed materials and PCB-contaminated oil extracts will be managed according to TSCA. |
| MDWPC - Supplemental Requirements for Hazardous Waste Management Facilities (314 CMR 8.00)[2] | Outlines additional requirements for water treatment unit, surface impoundment and POTW which treats hazardous waste. | Requirements will be considered during design and implementation of the water treatment system. |
| DEQE - Underground Water Source Protection (310 CMR 27.00)[1] | Regulates effluent contaminant concentrations to the ground. | Effluent contaminant concentration requirements must be considered prior to discharge of the treated groundwater via the aquifer recharge system. |
| CAA - NAQS for Total Suspended Particulates (40 CFR 129.105, 750)[1] | This regulation specifies maximum primary and secondary 24-hr. concentrations for particulate matter. Fugitive dust emissions from site excavation activities must be maintained below 260 ug/m$^3$ (primary standard). | Fugitive dust emissions will be controlled during construction to maintain concentrations below these levels. |
| DEQE - Ambient Air Quality Standards for the Commonwealth of Massachusetts (310 CMR 6.00)[1] | This regulation specifies dust, odor, and noise emissions from construction activities. | Fugitive dust will be controlled by water sprays or suppressants. All equipment will be maintained so as not to produce excessive noise. |
| DEQE - Air Pollution Controls (310 CMR 7.00)[1] | Regulates new sources of air pollution to prevent air quality degradation. Requires the use of "Best Available Control Technology" (BACT) on all new sources. | BACT will be used on all new sources. |
| USEPA Office of Solid Waste and Emergency Response, Directive 9355.0-28; Air Stripper Control Guidance | Establishes guidance on the control of air emissions from air strippers used at Superfund sites for groundwater treatment. | VOCs will be controlled in air stripper emissions with Best Available Control Technology under Massachusetts' requirements. |
| Land Ban HSWA (40 CFR 268 - Subpart D)[1] | Restricts land disposal of specified hazardous wastes. | Waste residuals produced by groundwater treatment will be properly disposed or treated as required by the regulations. |

[1] Applicable
[2] Relevant and Appropriate
[3] To be Considered

## TABLE 18
## ACTION-SPECIFIC ARARS FOR ALTERNATIVE SC-3
## SOLVENT EXTRACTION
## NORWOOD PCB SITE

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| OSHA-General Industry Standards (29 CFR 1910)[1] | These regulations specify the 8-hr. time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 9910.120 | Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations. Fugitive dust emissions will be controlled during construction to maintain concentrations below these levels. |
| OSHA-Safety and Health Standards (29 CFR 1926)[1] | This regulation specifies the type of safety equipment and procedures to be followed during site remediation. | All appropriate safety equipment will be worn on site during construction and procedures will be followed during environmental monitoring. |
| Resource Conservation and Recovery Act (RCRA), RCRA Subtitle C, 40 CFR 260 | RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 121(D)(3)) that hazardous substances from response actions be disposed of at facilities in compliance with Subtitle C of RCRA. | All excavation, storag, treatment, and disposal activities will be designed and implemented in accordance with applicable RCRA regulations. |
| OSHA-Recordkeeping, Reporting and Related Regulations (29 CFR 1904)[1] | This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA. | This regulation will be applicable to the construction company(s) contracted to perform the specified construction activities and monitor soils and sediments prior to disposal. |
| DEP - Standards for Owners and Operators of Permitted Hazardous Waste Facilities (310 CMR 30.510 - 516)[2] | General facility requirements outline general waste analysis, security measures, inspections, and training requirements. | During all site work, a written waste analysis plan must be developed and maintained on site. Entry to the site must be prevented by a 24 hr. surveillance system and appropriate signs posted. A written inspection program must be developed, and all personnel must complete an on-the-job training program to ensure facility compliance. |
| DEP - Contingency Plan, Emergency Procedures, Preparedness and Prevention (310 CMR 30.520 - 524)[2] | This regulation outlines requirements for safety equipment and spill control. | Safety and communication equipment will be installed at the site; local authorities will be familiarized with site operations and construction activities will be conducted to prevent any type of spillage or contaminated runoff from leaving the site. |
| DEP - Closure and Post-Closure (310 CMR 30.580 - 595)[2] | This regulation details specific requirements for closure and post-closure of hazardous waste facilities. | Treated solids will be monitored to insure they can be disposed of onsite without further treatment. The treatment units and associated pads will be decontaminated, dismantled, and removed from the site. |

Table 18
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| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| Interim RCRA/CERCLA Guidance on Non-Contiguous Sites and Onsite Management of Waste and Treated Residue (USEPA Policy Statement March 27, 1986)[3] | If a treatment of storage unit is to be constructed for onsite remedial action, there should be a clear intent to dismantle, remove, or close the unit after the CERCLA action is completed. Should there be plans to accept commercial waste at the facility after the CERCLA waste has been processed, it is EPA policy that a RCRA permit be obtained before the unit is constructed. | After completion of the treatment process, the B.E.S.T. equipment will be decontaminated and removed from the site. Any materials that cannot be decontaminated will be disposed of in an offsite landfill. |
| Fish and Wildlife Coordination Act USC661 et. seq. | This act requires that before undertaking any Federal action that causes the modification of any body of water or affects fish and wildlife, the following agencies must be consulted: the appropriate State agency exercising jurisdiction over Wildlife Resources and the U.S. Fish and Wildlife Service. | During the identification, screening, and evaluation of alternatives, the effects on wetlands are evaluated. If an alternative modifies a body of water, EPA must consult the U.S. Fish and Wildlife Service. |
| CAA-NAQS For Total Suspended Particulates (40 CFR 129.105, 750)[2] | This regulation specifies maximum primary and secondary 24-hr. concentrations for particulate matter. Fugitive dust emissions from site excavation activities must be maintained below 260 ug/m$^3$ (primary standard). | Fugitive dust emissions will be controlled during construction to maintain concentrations below these levels. |
| TSCA - Disposal Requirements (40 CFR 761.60)[1] | Establishes treatment and disposal concentrations of PCBs in soils for all alternatives which include the disturbance of PCB-contaminated soil. | Treatment or disposal of excavated soils and sediments will be performed in accordance with these regulations. |
| TSCA - Storage Requirements (40 CFR 761.65)[1] | Outlines requirements for temporary TSCA-regulated waste storage including specific design requirements. | Proper design considerations will be implemented to insure that all storage of TSCA-regulated waste satisfies the requirements of the regulations. |
| TSCA - Chemical Waste Landfill Requirements (40 CFR 761.75)[1] | Establishes standard for PCB landfills including provisions for the Regional Administrator to waive requirements. | Disposal of treated soils and sediments will comply with this regulation, but will include waivers for clay soils, synthetic liner and 50 feet to water table. |
| DEP - Hazardous Waste Regulations, Phase I and II (310 CMR 30.00)[2] | This regulation provides a comprehensive program for the handling, storage and recordkeeping at hazardous waste facilities. This regulation supplements RCRA regulations. | All handling, storage, and record keeping executed at the site will be performed in a manner consistent with regulations. |
| DEP - Wetlands Protection (310 CMR 10.00)[1] | This regulation outlines the requirements necessary to work within 100 feet of a coastal or inland wetland. | Wetlands disturbed by excavation will be returned to their natural state following treatment of soils. |
| CWA - Disposal of Dredged or Fill Material (40 CFR 230)[1] | Regulates the discharge of dredged material to control the impacts on wetlands. | Wetlands disturbed by excavation will be returned to their natural state following treatment of soils. |

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| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| DEQE - Ambient Air Quality Standards for the Commonwealth of Massachusetts[1] (310 CMR 6.00) | This regulation specifies dust, odor, and noise emissions from construction activities. | Fugitive dust will be controlled by water sprays or suppressants. All equipment will be maintained so as not to produce excessive noise. |
| | The act prohibits discharges to the atmosphere that create an odor nuisance or air pollution beyond the property line. | Design of the B.E.S.T. solvent extraction technology considers the proper handling and use of TEA. |
| DEQE - Air Pollution Controls[1] (310 CMR 7.00) | Regulates new sources of air pollution to prevent air quality degradation. Requires the use of "Best Available Control Technology" (BACT) on all new sources. | BACT will be used on all new sources. |
| Waterways Regulations[1] (314 CMR 9.00)[1] | Regulates the water quality certification of dredging and disposal of dredged material. | Dredging of sediments will be implemented according to regulations, including constant monitoring of downstream waters during implementation to control migration of contaminated sediments. |
| USEPA Office of Solid Waste and Emergency Response, Directive 9355.0-28; Air Stripper Control Guidance[2] | Establishes guidance on the control of air emissions from air strippers used at Superfund sites for groundwater treatment. | VOCs will be controlled in air stripper emissions with Best Available Control Technology under Massachusetts' requirements. |
| HSWA-Land Ban (40 CFR 268, Sub D)1 | Restricts land disposal of specified hazardous wastes. | Waste residuals produced by solvent extraction will be properly disposed or treated as required by the regulations. |

[1] Applicable
[2] Relevant and Applicable
[3] To be Considered

## TABLE 18
## ACTION-SSPECIFIC ARARS FOR ALTERNATIVE SC-5
## ONSITE INCINERATION
## NORWOOD PCB SITE

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| OSHA-General Industry Standards (29 CFR 1910)[1] | These regulations specify the 8-hr. time-weighted average concentration for various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 9910.120 | Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations. Fugitive dust emissions will be controlled during construction to maintain concentrations below these levels. |
| OSHA-Safety and Health Standards (29 CFR 1926)[1] | This regulation specifies the type of safety equipment and procedures to be followed during site remediation. | All appropriate safety equipment will be worn on site during construction and procedures will be followed during environmental monitoring. |
| Resource Conservation and Recovery Act (RCRA), RCRA Subtitle C,[1] 42 U.S.C. § 692 et seq.[1] | RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 121(d)(3)) that hazardous substances from response actions be disposed of at facilities in compliance with Subtitle C of RCRA. | Any facility used for off-site disposal will operate in compliance with applicable RCRA regulations. |
| OSHA-Recordkeeping, Reporting and Related Regulations (29 CFR 1904)[1] | This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA. | This regulation will be applicable to the construction company(s) contracted to perform the specified construction activities and monitor the soils and sediments prior to disposal. |
| DEP - Standards for Owners and Operators of Permitted Hazardous Waste Facilities (310 CMR 30.510 - 516)[2] | General facility requirements outline general waste analysis, security measures, inspections, and training requirements. | During all site work, a written waste analysis plan must be developed and maintained on site. Entry to the site must be prevented by a 24 hr. surveillance system and appropriate signs posted. A written inspection program must be developed, and all personnel must complete an on-the-job training program to ensure facility compliance. |
| DEP - Contingency Plan, Emergency Procedures, Preparedness and Prevention (310 CMR 30.520 - 524)[2] | This regulation outlines requirements for safety equipment and spill control. | Safety and communication equipment will be installed at the site; local authorities will be familiarized with site operations and construction activities will be conducted to prevent any type of spillage or contaminated runoff from leaving the site. |
| DEP - Closure and Post-Closure (310 CMR 30.580 - 595)[2] | This regulation details specific requirements for closure and post-closure of hazardous waste facilities. | Treated solids will be monitored to insure they can be disposed of onsite without further treatment. The treatment units and associated pads will be decontaminated, dismantled, and removed from the site. |
| DEP - Hazardous Waste Regulations, Phase I and II (310 CMR 30.00)[2] | This regulation provides a comprehensive program for the handling, storage and recordkeeping at hazardous waste facilities. This regulations operate in lieu of federal | All handling, storage, and recordkeeping executed at the site will be performed in a manner consistent with regulations. |

| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| Clean Air Act (CAA) - National Air Quality Standards (NAQS) (440 CFR 1 to 99)[2] | Applies to major stationary sources such as treatment units that have the potential to emit significant amounts of pollutants such as $NO_x$, $SO_2$, CO, lead, mercury and particulates (more than 250 tons/year). Regulations under CAA do not specifically regulate emissions from hazardous waste incinerators, but it is likely that Prevention of Significant Deterioration (PSD) provisions would apply to an onsite treatment facility. | If necessary, the incinerator will be constructed and operated to achieve emissions of these contaminants at levels equal to or less than those required for stationary treatment units. |
| Interim RCRA/CERCLA Guidance on Non-Contiguous Sites and Onsite Management of Waste and Treated Residue (USEPA Policy Statement March 27, 1986)[3] | If a treatment of storage unit is to be constructed for onsite remedial action, there should be a clear intent to dismantle, remove, or close the unit after the CERCLA action is completed. Should there be plans to accept commercial waste at the facility after the CERCLA waste has been processed, it is EPA policy that a RCRA permit be obtained before the unit is constructed. | After completion of the incineration process, the incinerator will be decontaminated and removed from the site. Any materials that cannot be decontaminated will be disposed of in an offsite landfill. |
| Fish and Wildlife Coordination Act[1] USC661 et. seq. | This act requires that before undertaking any Federal action that causes the modification of any body of water or affects fish and wildlife, the following agencies must be consulted: the appropriate State agency exercising jurisdiction over Wildlife Resources and the U.S. Fish and Wildlife Service. | During the identification, screening, and evaluation of alternatives, the effects on wetlands are evaluated. If an alternative modifies a body of water, EPA must consult the U. S. Fish and Wildlife Service. |
| CAA-NAQS For Total Suspended Particulates[2] (40 CFR 129.105, 750)[2] | This regulation specifies maximum primary and secondary 24-hr. concentrations for particulate matter. Fugitive dust emissions from site excavation activities must be maintained below 260 $ug/m^3$ (primary standard). | Fugitive dust emissions will be controlled during construction to maintain concentrations below these levels. |

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| ARARs | Requirement Synopsis | Action to be Taken to Attain ARARs |
|---|---|---|
| TSCA - Disposal Requirements (40 CFR 761.60)[1] | Establishes treatment and disposal concentrations of PCBs in soils for all alternatives which include the disturbance of PCB-contaminated soil. | The incinerator will be constructed and operated to attain a 99.9999% destruction and removal efficiency. |
| TSCA - Storage Requirements (40 CFR 761.65)[1] | Outlines requirements for temporary TSCA-regulated waste storage facilities including specific design requirements. | Proper design considerations will be implemented to insure that all storage of TSCA-regulated waste satisfies the requirements of the regulations. |
| TSCA (40 CFR 761.70)[1] | Lists special performance standards for incineration of PCBs. | The incinerator will be constructed and operated to attain a 99.9999% destruction and removal effeciency of organics and PCBs in all wastes to be treated. |
| DEQE - Wetlands Protection (310 CMR 10.00)[1] | This regulation outlines the requirements necessary to work within 100 feet of a constal or inland wetland. | Wetlands disturbed by excavation will be returned to their natural state following treatment of soils. The incinerator will be sited outside of the wetlands. |
| CWA - Disposal of Dredged or Fill Material (40 CFR 230)[1] | Regulates the discharge of dredged material to control the impacts on wetlands. | Wetlands disturbed by excavation will be returned to their natural state following treatment of soils. |
| DEQE - Ambient Air Quality Standards for the Commonwealth of Massachusetts[1] (310 CMR 6.00) | This regulation specifies dust, odor, and noise emissions from construction activities.<br>The act prohibits discharges to the atmosphere that create an odor nuisance or air pollution beyond the property line. | Fugitive dust will be controlled by water sprays or suppressants. All equipment will be maintained so as not to produce excessive noise.<br>Design of the B.E.S.T. solvent extraction technology considers the proper handling and use of TEA. |
| DEQE - Air Pollution Controls[1] (310 CMR 7.00) | Regulates new sources of air pollution to prevent air quality degradation. Requires the use of "Best Available Control Technology" (BACT) on all new sources. | BACT will be used on all new sources. |
| Waterways Regulations (314 CMR 9.00)[1] | Regulates the water quality certification of dredging and disposal of dredged material. | Dredging of sediments will be implemented according to regulations, including constant monitoring of downstream waters during implementation to control migration of contaminated sediments. |
| USEPA Office of Solid Waste and Emergency Response, Directive 9355.0-28; Air Stripper Control Guidance[2] | Establishes guidance on the control of air emissions from air strippers used at Superfund sites for groundwater treatment. | VOCs will be controlled in air stripper emissions with Best Available Control Technology under Massachusetts' requirements. |

# TABLE 19

## FEDERAL AND STATE STANDARDS AND CRITERIA FOR SUMMARY OF CHEMICALS OF POTENTIAL CONCERN IN GROUND WATER

## NORWOOD PCB SITE

(All concentrations in ug/liter)

| CHEMICAL | MAXIMUM CONTAMINANT LEVELS (relevant and appropriate) | MASSACHUSETTS GROUNDWATER STANDARDS (applicable) | MASSACHUSETTS DRINKING WATER STANDARDS (relevant and appropriate) |
|---|---|---|---|
| Chlorinated Aliphatics | | | |
| Vinyl Choride | 2 | 2 | 2 |
| 1,1-Dichloroethene | 7 | 7 | 7 |
| 1,1-Dichlorethane | -- | -- | -- |
| trans-1,2 Dichlorethene | -- | -- | -- |
| 1,1,1-Trichloroethane | 200 | 200 | 200 |
| Trichloroethene | 5 | 5 | 5 |
| Tetrachloroethene | -- | 5 | -- |
| Chloroform | -- | -- | -- |
| Monocyclic Aromatics | | | |
| Benzene | 5 | 5 | 5 |
| Toluene | -- | 2,000 | -- |
| Chorobenzene | -- | -- | -- |
| 1,2-Dichlorobenzene | 20 | 600 | -- |
| Ethylbenzene | -- | 700 | -- |
| Xylenes | -- | 1,000 | -- |
| 1,4-Dichlorobenzene | 75 | 5 | -- |
| Other Volatiles | | | |
| Acetone | -- | 700 | -- |
| Semi-Volatiles | | | |
| Diethyl Phthalate | -- | -- | -- |
| Bis(2-ethylhexyl) phthalate | 10 | 10 | -- |
| Naphthalene | -- | -- | -- |
| Di-n-butylphthalade | -- | -- | -- |
| Carcinogenic PAHs | -- | -- | -- |
| PCBs | -- | -- | -- |
| Inorganics | | | |
| Copper | -- | 1,000 | -- |
| Nickel | -- | -- | -- |
| Qualitative Assessment Only | | | |
| Noncarcinogenic PAHs | -- | -- | -- |
| Cobalt | -- | -- | -- |

# TABLE 20
## GROUNDWATER CLEANUP CRITERIA
## NORWOOD PCB SITE AND SURROUNDING AREA
## NORWOOD PCB SITE FEASIBILITY STUDY

| Chemical/Scenario | Target Risk Level (10-4 to 10-7) | Health-Based Cleanup Criterion (ug/l) | Maximum Contaminant Level (ug/l) | Massachusetts Groundwater Criteriaa (ug/l) | Lifetime Health Advisories (ug/l) | Maximum Contaminant Level Goals (ug/l) | Contract Required Quantitation Limits (ug/l) |
|---|---|---|---|---|---|---|---|
| Ingestion of Groundwater by Future Residents: | | | | | | | |
| Average Case: | | | | | | | |
| PCBs | $10^{-4}$ | 0.45 | -- | 0(P)a | -- | 0(P) | 0.5 - 1.0 |
| | $10^{-5}$ | 0.045 | | | | | |
| | $10^{-6}$ | 0.0045 | | | | | |
| | $10^{-7}$ | 0.00045 | | | | | |
| 1,4 Dichlorobenzene | $10^{-4}$ | 140 | 75 | 5 | 75 | 75 | 10 |
| | $10^{-5}$ | 14 | | | | | |
| | $10^{-6}$ | 1.4 | | | | | |
| | $10^{-7}$ | 0.14 | | | | | |
| 1,1,2,2-Tetrachloroethane | $10^{-4}$ | 18 | -- | -- | -- | 5 | -- |
| | $10^{-5}$ | 1.8 | | | | | |
| | $10^{-6}$ | 0.18 | | | | | |
| | $10^{-7}$ | 0.018 | | | | | |
| Tetrachloroethene | $10^{-4}$ | 68 | 5(P) | 5 | 10 | 3(T) | 5 |
| | $10^{-5}$ | 6.8 | | | | | |
| | $10^{-6}$ | 0.68 | | | | | |
| | $10^{-7}$ | 0.068 | | | | | |
| 1,1,2-Trichloroethane | $10^{-4}$ | 62 | -- | -- | -- | -- | 5 |
| | $10^{-5}$ | 6.2 | | | | | |
| | $10^{-6}$ | 0.62 | | | | | |
| | $10^{-7}$ | 0.062 | | | | | |
| Trichloroethene | $10^{-4}$ | 320 | 5 | 0(P)a | -- | 0 | 5 |
| | $10^{-5}$ | 32 | | | | | |
| | $10^{-6}$ | 3.2 | | | | | |
| | $10^{-7}$ | 0.32 | | | | | |
| | HI = 1 | 260 | | | | | |
| | HI = 0.2 | 52 | | | | | |

Table 20
Page Two

| Chemical/Scenario | Target Risk Level (10-4 to 10-7) | Health-Based Cleanup Criterion (ug/l) | Maximum Contaminant Level (ug/l) | Massachusetts Groundwater Criterias (ug/l) | Lifetime Health Advisories (ug/l) | Maximum Contaminant Level Goals (ug/l) | Contract Require Quantitation Limi (ug/l) |
|---|---|---|---|---|---|---|---|
| Vinyl Chloride | $10^{-4}$ | 1.5 | 2 | 2 | -- | 0 | 5 |
| | $10^{-5}$ | 0.15 | | | | | |
| | $10^{-6}$ | 0.015 | | | | | |
| | $10^{-7}$ | 0.0015 | | | | | |
| 1,2,4-Trichlorobenzene | HI = 1 | 700 | -- | -- | -- | 9(T) | 10 |
| | HI = 0.2 | 140 | | | | | |

a Shall not exceed health advisories which have been adopted by the Massachusetts Division of Water Pollution Control and/or the EPA.

(P) Proposed
(T) Tentative
(HI) Hazard Index

# TABLE 21

## Summary of Total Cost of Remedy

**BREAKDOWN OF SELECTED REMEDY COST**

**Source Control (Soils, Sediments) Component**
Estimated Time for Design, Construction and Operational Startup:
2 years
Estimated Total Capital Costs: $10,749,000
Estimated Operation and Maintenance Cost: $2,511,000
Estimated Total Present Worth: $13,260,000

**Source Control (Drainage System and Building) Component**
Estimated Time for Design, Construction and Operational Startup:
8 months
Estimated Total Present Worth: Approximately $300,000

**Management of Migration (Groundwater) Component**
Estimated Time for Design, Construction and Operational Startup:
1.5 years
Estimated Total Capital Costs: $1,018,000
Estimated Operation and Maintenance Cost: $1,483,000
Estimated Total Present Worth: $2,501,000

The estimated total present worth cost of the selected remedy including all SC and MM components is $16,100,000.

# APPENDIX A
# RESPONSIVENESS SUMMARY
# NORWOOD PCB SUPERFUND SITE

# FINAL RESPONSIVENESS SUMMARY
# NORWOOD PCB SUPERFUND SITE
# NORWOOD, MASSACHUSETTS

SEPTEMBER 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION I

# NORWOOD PCB SUPERFUND SITE
# RESPONSIVENESS SUMMARY
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EXHIBIT B - TRANSCRIPT OF THE AUGUST 24, 1989 INFORMAL PUBLIC HEARING

## PREFACE

The U.S. Environmental Protection Agency (EPA) held a 30-day public comment period from August 11, 1989 to September 9, 1989 to provide an opportunity for interested parties to comment on the Feasibility Study (FS) and the August 1989 Proposed Plan prepared for the Norwood PCB Superfund site in Norwood, Massachusetts. The FS examines and evaluates various options, called remedial alternatives, for addressing contamination of groundwater, surface water, soil and sediment at the site. EPA identified its preferred alternative for the cleanup of the site in the Proposed Plan issued on August 10, 1989, before the start of the public comment period.

The purpose of this Responsiveness Summary is to identify major comments raised during the public comment period and to provide EPA response to the comments. EPA has considered all of the comments summarized in this document before selecting a final remedial alternative for the contamination at the Norwood PCB site in Norwood, Massachusetts.

This Responsiveness Summary is divided into the following sections:

I. Overview of the Preferred Alternative and Other Remedial Alternatives Considered in the Feasibility Study - This section briefly outlines the remedial alternatives, including EPA's preferred alternative, that are described and evaluated in detail in the FS and the Proposed Plan.

II. Background on Community Involvement and Concerns - This section provides a brief history of the site and of community interests and concerns regarding the Norwood PCB site.

III. Summary of Comments Received During the Public Comment Period and EPA Responses - This section summarizes and provides EPA responses to the oral and written comments received from the public during the public comment period. In Part I, the comments received from citizens are organized by subject. Part II lists the comments received from the PRPs and EPA's responses. A brief summary of PRP comments precedes EPA's detailed response.

Exhibit A - This exhibit is a list of the community relations activities that EPA has conducted to-date at the Norwood PCB site.

Exhibit B - This exhibit contains a copy of the transcript from the informal public hearing held on August 24, 1989.

## I. OVERVIEW OF THE PREFERRED ALTERNATIVE AND OTHER REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY

### EPA's Preferred Alternative for the Norwood PCB Site

EPA has developed a comprehensive three-part cleanup plan to address contamination at the Norwood PCB site. The preferred alternative is a combination of two source control (SC) alternatives: SC-1 and SC-A. Both SC alternatives are designed to address sources of contamination at the site. The first SC alternative addresses soil and sediment contamination, and the second SC alternative addresses contamination within the Grant Gear drainage system. In addition, the preferred alternative includes a management of migration (MM) alternative designed to address the migration of groundwater contamination at the site.

EPA's preferred alternative involves the excavation and treatment by on-site solvent extraction of soils contaminated with PCBs and other organic chemical-contaminated soils, dredge pile materials, and sediments to meet required target cleanup levels. The second SC alternative includes flushing, containing and replacing portions of the Grant Gear drainage system. In addition, the overall site remedial alternative involves collection and treatment of contaminated groundwater by air stripping, carbon adsorption and precipitation/filtration.

### Other Alternatives Evaluated in the Feasibility Study

The FS prepared for EPA by Ebasco Services, Inc. for the Norwood PCB site identifies and evaluates five SC alternatives to address soil and sediment contamination and four MM alternatives to address groundwater contamination to achieve EPA's cleanup objectives for the site. In addition, EPA evaluated four SC alternatives for remediation of the Grant Gear drainage system in the 1989 Grant Gear Building FS prepared by Camp, Dresser and McKee (CDM) for EPA. The Proposed Plan, which identifies the alternatives EPA recommended for the site, also contains brief descriptions of each of the alternatives considered in detail in the Norwood PCB site FS and the Grant Gear Building FS. These SC and MM alternatives, including the preferred alternatives identified in the Proposed Plan, are listed below. A detailed description of remedial alternatives can be found in the Norwood PCB site FS, the Grant Gear Building FS, and EPA's Record of Decision. These documents are available as part of the Administrative Record for the site at the Morrill Memorial Library on Walpole Street in Norwood, Massachusetts and the EPA Records Center at 90 Canal Street, Boston, Massachusetts.

## 1. SOURCE CONTROL ALTERNATIVES (Soils, Sediments):

The purpose of implementing SC-1 alternatives at the Norwood PCB site is to address contaminated soils and sediments. The FS for the Norwood PCB site evaluated the five SC-1 alternatives listed below.

#1. Limited No Action
#2. Capping of Soils and Sediments
#3. On-Site Solvent Extraction (EPA's Preferred SC-1 Alternative)
#4. On-Site Dechlorination
#5. On-Site Incineration

## 2. SOURCE CONTROL ALTERNATIVES (Grant Gear Drainage System):

The Grant Gear Building FS evaluated three SC-A alternatives to address contamination within the Grant Gear drainage system which is also considered to be a source of groundwater contamination. These alternatives are listed below.

#1. No Action
#2. Flushing/Cleaning of Drainage System (EPA's Preferred SC-A Alternative)
#3. Containment of Drainage System
#4. Removal of Drainage System

## 3. MANAGEMENT OF MIGRATION ALTERNATIVES

The FS also evaluated four MM alternatives to manage the migration of contaminants by collecting and treating contaminated groundwater to prevent the spread of contamination. These alternatives are listed below.

#1. Limited No Action
#2. Air Stripping (EPA's Preferred MM Alternative)
#3. Carbon Adsorption
#4. Ultraviolet/Oxidation

## II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Norwood PCB site is located on 26 acres of mostly commercial and industrial properties in Norwood, Massachusetts. The site consists of several parcels of land, including the Grant Gear facility where gears are produced for industry; Kerry Place, an office park; an automobile dealership; a restaurant; and associated parking areas and adjacent fields.

Beginning in the 1940's, previous owners and operators of the Grant Gear building used polychlorinated biphenyls (PCBs) in the production of electrical transformers and other electrical components. In 1983, the Massachusetts Department of Environmental Protection (DEP), formerly the Massachusetts Department of Environmental Quality Engineering, in response to a complaint from an area resident, investigated the site and found high levels of PCBs in soils and on interior surfaces of the Grant Gear building. Community residents were very concerned about health risks associated with exposure to site soils and contaminated equipment within the Grant Gear facility, and media coverage of site contamination during this time period was extensive.

In the summer of 1983, at the request of DEP, EPA conducted an emergency removal of over 500 tons of highly contaminated soil from the present Kerry Place and Grant Gear properties. In 1983, the Massachusetts Department of Public Health, responding to Norwood residents' health concerns, conducted a blood testing program of those residents who had experienced the most direct contact with the site. The test results showed PCB-blood levels were not elevated. Community concern about the site diminished following the emergency soil removal and publication of blood test results.

In October 1986, the Norwood PCB site was added to EPA's National Priorities List making it eligible to receive federal funds for investigation and cleanup under the Superfund program. In 1986, DEP implemented an Interim Remedial Measure (IRM) at the site to limit access to the areas of highest surface soil contamination. The IRM included the installation of a 4-foot high wire mesh fence around a 1.5-acre portion of the northwest and southwest corners of the Grant Gear property and covering contaminated soils within the fenced areas. The cover consists of a filter-fabric liner and six inches of crushed stone.

In July 1987, the Norwood General Manager initiated quarterly meetings with EPA to discuss local complaints about site cleanup delays and to keep informed about site activities. In 1987, EPA began a Remedial Investigation (RI) and Feasibility Study (FS) at the site which included sampling and analysis of soil, groundwater, surface water, stream sediments and four dredge piles located along the south bank of Meadow Brook. After the RI was initiated, community interest regarding the Norwood site increased considerably. At a January 1988 meeting with Norwood town officials, EPA announced that preliminary sampling results detected high levels of PCBs in and along Meadow Brook. Community concern focused on potential adverse health effects from exposure to the Brook area. The Town of Norwood subsequently constructed a fence restricting access to the Brook.

In addition, because of contamination in Meadow Brook sediments, implementation of a 1988 flood control project that would have required dredging of the Brook, was delayed. Brook flooding during heavy rains caused storm sewer overflows in residences abutting the Brook. Neighbors became concerned that the flood waters were also spreading contaminants into their yards and basements. Elevated community concern about Meadow Brook flooding prompted several meetings of federal and state legislators and EPA representatives between 1987 and 1989 to discuss expediting cleanup of the Meadow Brook portion of the Norwood PCB site.

Public interest has continued at a low to moderate level throughout the RI/FS process. In June 1989, EPA completed the RI and presented RI results at a public informational meeting. Those at the meeting expressed frustration with site cleanup delays and the postponement of the Meadow Brook flood control project. EPA held a public informational meeting and a public hearing in August 1989 to present the Proposed Plan and FS. The Proposed Plan meeting received extensive media coverage. The principal community concerns expressed at the hearing are summarized below.

Solvent Extraction. Residents expressed concern about the reliability and safety of the solvent extraction process. Some residents expressed a preference for on-site incineration to treat contaminated soils and sediments.

Meadow Brook Flood Control. Residents and officials requested a meeting with EPA to discuss remedial design plans for Meadow Brook sediment excavation. They asked EPA to make Meadow Brook cleanup a priority and expressed concern about the potential spreading of contaminants during floods.

Groundwater Quality. Residents expressed frustration with groundwater target cleanup goals. Residents requested additional information about potential health problems resulting from exposure to contaminated groundwater.

## III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

This Responsiveness Summary addresses the comments received by EPA concerning the FS and Proposed Plan for the Norwood PCB Superfund site in Norwood, Massachusetts. Five sets of written comments were received during the public comment period (August 11, 1989 - September 9, 1989). Eight commenters orally presented their concerns at the August 24, 1989 informal public hearing. A copy of the transcript is included as Attachment B. Copies are also available at the Morrill Memorial Library on Walpole Street in Norwood, Massachusetts, the information repository that EPA has established for the site; and at the EPA Records Center at 90 Canal Street, Boston, Massachusetts as a part EPA's Administrative Record.

The comments from citizens, along with EPA responses, are summarized and organized into the following categories:

A. Comments Regarding EPA's Preferred Alternative
B. Comments Regarding Meadow Brook
C. Comments Regarding Groundwater Contamination
D. Comments Regarding Public Health
E. General Comments

### Part I - Citizen Comments

### A. Comments Regarding EPA's Preferred Alternative

1. One commenter wanted an explanation of the operation and maintenance costs included as part of the groundwater and soil treatment alternative, and asked if there is going to be some ongoing operation and maintenance at the site for a period of time after cleanup.

   EPA Response: The cost estimates prepared for the Norwood Site included both capital costs, and annual operation and maintenance costs. The capital costs are the expected costs that would be incurred within the first year of operation. Annual operation and maintenance costs are costs that extend beyond the first year of operation. All costs incurred after the first year of operation were converted into current dollars through a present worth analysis.

   Operation costs associated with the solvent extraction alternative include the cost of utilities (i.e., water for the decontamination pad activities), the solvent extraction process and mobile lab use, (these will be utilized longer than one year, thus they have an operations cost associated with them) and the wetlands restoration project (which will require periodic visits to monitor growth and may extend for as long as five years).

Maintenance costs associated with the solvent extraction process include upkeep of the perimeter fence, keeping all equipment in efficient working order, and general maintenance associated with any construction site.

Operation costs associated with the air stripping alternative include utilities (electricity to run pumps), carbon replacement costs, treatment plant operation (operators, chemical costs, sludge handling), and long-term monitoring and site review. The long-term review is necessary as the alternative is anticipated to be in operation for approximately 10 years.

Maintenance costs associated with the selected management of migration alternative include general equipment overhaul, pump replacement, fencing repairs, and other typically required water treatment plant maintenance.

2. One commenter wanted to know the length of time of the cleanup, and asked what the difference in cleanup time is between incineration and solvent extraction.

   EPA Response: The estimated time of cleanup of the site solids is 4 years; 2 years for design, bid preparation, contract negotiation, bench scale studies, and other pre-implementation activities, and approximately 2 years of field operations. The estimated time of cleanup of the volatile organic chemicals present in the site groundwater is 10 years.

   The estimated cleanup times for solvent extraction and on-site incineration are very similar. Both processes have units that operate at approximately 100 tons/day, thus, the actual time spent on-site would be very similar. Both processes are complex and will require extensive design and careful scheduling to ensure an efficient operation at the site. The solvent extraction system would require bench-scale pilot testing. The on-site incinerator would be required to perform a test burn. Time of cleanup of the site soils by the solvent extraction process may be slowed by materials handling problems. Time of cleanup by the on-site incinerator may be slowed by material handling problems and excessive solids water content. Thus, it is estimated that the time required for either alternative is approximately the same.

3. Several commenters expressed their preference for incineration of contaminated soils and sediments over solvent extraction treatment. The commenters stated that they are opposed to the use of solvent extraction because

they do not want any additional chemicals brought to the site. One commenter stated that he thought solvent extraction was selected by EPA because it is less costly than incineration, although incineration is a proven technology.

EPA Response: The solvent extraction system proposed for removal of PCBs from the soils is a closed system. The chemical extractant is added to a volume of soil within a closed reactor vessel, allowed to react and the washed soil is removed from the vessel to use as fill. The liquid solvent/PCB/water mixture is then heated, separating the solvent/PCB-contaminated soils from the PCB-free water and collected for disposal. The solvent is separated in a stripping column and recycled for use in the system. Soils are checked as they are removed from the vessel to ensure that the soils meet the target cleanup goal. Low level residual chemicals on the soils quickly volatilize as the soils are removed from the vessel. All pipe connections and storage tanks are protected against spills with spill prevention catch basins. Although many of the soil wash technologies have not been tested on superfund soils, these technologies have been commercially applied to the extraction of organic contaminants from various sources. Additionally, the implementability and effectiveness of the technology will be assessed with treatability studies, during the final design prior to full scale adaptation to the site soils.

The rationale for choosing the selected alternative is based on an assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been found to be protective of human health and the environment and able to attain ARARs unless a waiver is invoked. In assessing the alternatives that meet these statutory requirements, EPA focused on the other evaluation criteria, including, short-term effectiveness, long-term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume of hazardous substances, and cost. EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA selected the remedial approach for the Site.

As described in the FS and Section XI of the ROD, based on the performance potential of solvent extraction, this innovative technology provides the best balance of tradeoffs from among the options considered, despite its uncertainties. Specifically, both solvent extraction (selected technology) and on-site incineration (selected as the backup technology) and on-site incineration (selected as the backup technology) meet the statutory preference for utilizing treatment technologies that significantly and permanently reduce the toxicity, volume or mobility of all hazardous substances. Although solvent extraction is an innovative treatment, the results of treatability studies performed on various soils and sediments at other Superfund sites indicates that this technology will be effective in meeting cleanup levels for soils, sediments and dredge pile materials. This determination will be confirmed by site-specific treatability studies on solvent extraction. If results of these studies indicate that solvent extraction would not be implementable or effective or is determined to be significantly more costly than incineration, then EPA will select on-site incineration as the treatment technology for the remediation of soils, sediments and dredge pile materials. Incineration is a proven technology for meeting the soil cleanup levels. Solvent extraction has been selected over on-site incineration because it is an alternate treatment, as preferred by CERCLA, and is equally effective as incineration in attaining the protective cleanup levels of this remedy but at a lower estimated present worth cost ($13.3 million for solvent extraction; $17.2 million for incineration). Both solvent extraction and on-site incineration will comply with ARARs. Finally, comments received during the public comment period indicate that while a limited number of the public prefers on-site incineration, the state prefers solvent extraction.

4. Several commenters asked why EPA is not removing all contamination from the site including contaminated pavement, the drainage pipe within the Grant Gear buildings, oil beneath the Grant Gear building, and soil on the Hyundai and Kerry Place properties. One commenter specifically requested that the Grant Gear drainage system be removed. Several commenters asked EPA to buy out the Grant Gear company and demolish the building, and stated that the contamination on and in the building continues to pose a risk to the workers at the Grant Gear.

   EPA Response: EPA has determined that for this Site, only contaminated unsaturated soils will be excavated and treated. This determination is made primarily on the basis of three criteria: implementability, effectiveness and cost. Specifically, excavation of saturated soils would require dewatering in areas to be excavated. As discussed in Chapter 7 of the FS in the discussion of the active groundwater extraction system, the design of any active dewatering operation would require special measures to prevent the drawing of Meadow Brook surface waters into the extraction system. A slurry wall, commonly used in such cases, would present long-term impacts by restricting groundwater flow in and around its location for periods after implementation of the dewatering operation. Areas to be excavated in the saturated zone would include areas immediately adjacent to the Grant Gear building. Disadvantages associated with extensive excavation of soils in and around the building include possible structural damage to the building and the exterior drainage system. Because results of the RI indicated that the weathered bedrock may also be contaminated the effectiveness of this excavation will be limited to the ability to locate and remove all contaminated weathered bedrock as well as all saturated soils.

It is also of significance that any residual PCB levels in bedrock or saturated soils not removed during implementation of this remedial action may contribute to PCB levels in groundwater above any human health-based risk level. Finally, additional costs relating to health and safety measures (groundwater within saturated soils is contaminated), dewatering operation (e.g. extraction system) before and after excavation and treatment of collected waste residuals.

As stated above, removal and treatment of all saturated soils, even if possible, will not ensure levels in groundwater protective of human health. Additionally, major disadvantages are associated with the implementability of this alternative. EPA believes that the costs required to implement this alternative is not proportionate to its overall effectiveness. Therefore, based on the description above, EPA has determined that it is impracticable to remediate contaminated saturated soils at this Site. However, all unsaturated soils with contaminant levels greater than soil target cleanup levels, as described in X.A.1.a., will be performed.

PCB levels in soils under paved area outside Grant Gear are less then 25 ppm, the soil cleanup level for soil in restricted access areas, as specified in the TSCA PCB Spill Policy Cleanup. Soils that are not accessible to the public do not pose a risk because exposure to contaminants is prevented by in this case pavement. EPA therfore believes that based on levels of PCBs in soils under pavement outside Grant Gear, remediation of such soils is not warranted.

Removal (SC-D) and off-site disposal of the drainage system is the least preferable alternative as defined by CERCLA. While removal from the Site would permanently reduce on-site contaminant levels, this alternative would simply move those contaminants to another site without treatment, and would not permanently reduce the mobility, toxicity or volume of the wastes. Further, removal is the most costly alternative while achieving no permanent T,M,V reduction. This alternative would also result in significant disruption to Grant Gear's operations and damage to building structures and its short-term effectiveness and risks would depend upon the ability to contain any releases of hazardous substances during the removal operations.

Demolition of the Grant Gear building would be no more effective then Removal or Containment but at much greater cost and disruption to Grant Gear operations. While this alternative could be effective, it would present significant technical difficulties in demolishing and disposal of building structures. Accordingly, this alternative was screened out of further consideration based on concerns with short-term risks, implementability, and a significant increase in cost with uncertain effectiveness over other alternatives.

Remediation of the Grant Gear building can obtain an acceptable limit of residual risk by washing/remediating contact surfaces within the building without the added destruction and exposure created by excavation of soils beneath the pavement and Grant Gear building.

5. One commenter asked if EPA would be excavating soils containing PCB concentrations greater than one part per million (ppm) in residential areas abutting the site.

   EPA Response: As is discussed in Section 6.2 and shown on Figure 6-1 of the FS, the specified PCB cleanup level along Meadow Brook is 1 ppm, both south of the brook between the Grant Gear fence and the stream, and north of the brook in the adjacent residential areas. Thus, all material in these areas, including residential properties, with PCB concentrations exceeding 1 ppm will be excavated and removed.

6. One commenter asked if PCBs pass through concrete and questioned the effectiveness of using concrete to seal the Grant Gear drainage system.

   EPA Response: PCBs will pass through concrete when dissolved in an organic oil or solvent carrier liquid if pressure is exerted on the liquid to force the PCB-solvent mixture through the pores in the concrete. Water samples obtained during the RI indicate that PCBs are attached to sediment within the Grant Gear drainage system and would not be in a form anticipated to pass through the concrete pipes. PCB-containing sediment is moved through the drainage system by the flow of water contained in the discharge. As part of the drainage system cleanup, sediment in the drainage system will be removed prior to sealing with concrete. The purpose of sealing the drainage system with concrete is to physically retain any residual sediment not removed prior to sealing within the drainage system pipes.

7. One commenter asked if the site cleanup includes the removal, treatment and disposal of the dredge piles located on the banks of Meadow Brook.

EPA Response: As is discussed in Section 6.2 and shown on Figure 6-1 of the FS, the dredge piles are included in the soil component of the selected remedy. As is specifically stated in Section 6.2.1 of the FS, paragraph 1, "In determining the location and volume of the soils to be excavated, the dredge piles were treated as soils and likewise grouped with the soil volumes." The material from the dredge piles that contain PCB concentrations greater than 10 ppm and PAH concentrations greater then 6 ppm would be treated by solvent extraction and disposed of on-site. Those dredge pile materials with PCB concentrations between 1 ppm and 10 ppm and PAH concentrations between 2ppm and 6 ppm would be excavated and disposed of on-site within the Grant Gear property boundary.

## B. Comments Regarding Meadow Brook

8. The Norwood General Manager, and several commenters, asked if the Town could get some agreement that the work they are going to do is not going to have to be redone by the Town or some other entity at a future time, and requested a cooperative effort between EPA and the Town of Norwood so that EPA's cleanup goals for Meadow Brook and the Town's flood control needs can both be met. The General Manager specifically asked EPA for a commitment to work together to achieve a mutually beneficial goal, which is not only the cleanup of the PCBs, but also the dredging and the increasing of the capacity of Meadow Brook. He asked that EPA adhere to the proposed cross-section specifications in the flood control project while conducting the cleanup, even if EPA excavates a greater volume of sediment than the volume proposed for the flood control project.

EPA Response: EPA will work with the Town of Norwood in achieving the mutually beneficial goals of cleanup and flood control in implementing the work to be performed on Meadow Brook. The acknowledgement of these goals is reflected in the alternative evaluations presented in the Feasibility Study through the identification of interactions between the flood control project requirements and the requirements of cleanup alternatives involving excavation. The conceptual cleanup plans evaluated in the FS that included excavation considered the estimated amount of clean fill required to bring Meadow Brook to the grade and cross-section required by the flood control project.

The wetlands restoration component of the selected remedy describes measures to be taken during remedial action of the Meadow Brook area which will incorporate plans for the flood control project. Therefore, upon completion of the soil and sediment excavation of the Meadow Brook from approximately the Grant Gear outfall to the Neponsent River, the brook streambed and adjacent banks from these areas will be restored, to the maximum extent feasible, in a manner consistent with the Meadow Brook flood control project plans and specifications. Upon completion of the flood control project, and bordering wetland areas impacted by dredging, excavation and/or associated activities performed in accordance with component (c) of the selected remedy, will be restored or enhanced, to the maximum extent feasible, to similar hydrological and botanical conditions existing prior to these activities. The restoration program will be developed during design of the selected remedy. This program will identify the factors which are key to a successful restoration of the altered wetlands. Factors may include, but not necessarily be limited to, replacing and regrading hydric soils, provisions for hydraulic control and provisions for vegetative reestablishment, including transplanting, seeding or some combination thereof. As described above, the restoration program will incorporate plans and specifications of the Meadow Brook flood control project for the Meadow Brook streambed and adjacent banks. A more detailed examination of the interaction between cleanup and flood control will be performed in coordination with the Town of Norwood during the design of the remedial action.

9. Several commenters were concerned about the length of time it will take to clean up the Meadow Brook area, and felt that EPA inaction over the years has prevented the Town from carrying out the Meadow Brook flood control project. The commenters were particularly concerned about the possibility of PCBs flooding in the streets during a rainstorm when the water backs up from the brook and the danger of kids playing in the streets during this time. The commenters urged EPA to make Meadow Brook cleanup activities a priority so that the Town can begin the Meadow Brook dredging project.

EPA Response: EPA concurs with the concern relative to the flood control project. This concern is intended to be addressed, to the degree possible, by prioritizing the streambed and dredge pile remediation component of the site remediation during the remedial design. Upon completion of the soil and sediment excavation of the Meadow Brook area, the brook streambed and adjacent banks will be restored, to the maximum extent feasible, in a manner consistent with the Meadow Brook flood control project plans and specifications.

10. One commenter was concerned about a flood plain disruption during site cleanup and asked EPA to take precautionary measures or come up with a plan to prevent flooding of residences during site cleanup.

EPA Response: During the development of alternatives, potential flooding of the local areas during construction was given consideration. A conceptual design was developed whereby the Meadow Brook waters would be routed into a pipe laid parallel to the brook to bypass the site. During the design stage, this conceptual design will be fully developed to ensure that the bypass piping is adequately sized to handle the anticipated flows from typical local storm events. Careful design and scheduling of sediment and soil removal will be utilized to protect the local area to the greatest extent possible.

11. One commenter stated that the Savagran Company, along with the Northrup Company and a neighboring foundry, use the same chemicals that are found in Meadow Brook and are consequently polluting the brook. The commenter asked if anything can be done to prevent further polluting of the brook after it is cleaned up.

EPA Response: To evaluate the potential for other contributors of contamination to Meadow Brook from upstream sources EPA collected samples from the brook upgradient of the Grant Gear facility in the vicinity of Kerry Place. These data were compared to the results of samples taken from downstream of the Grant Gear facility and to samples collected from the Grant Gear outfall to calculate the relative contribution from the site.

Only the Norwood PCB Site is on the National Priorities list and therefore qualifies for federal funding. Any investigations and remedial actions taken under Superfund must therefore be related to site contamination. EPA has relayed citizens' concern about these potential contributions to the State.

12. One commenter asked if EPA would be testing drinking water in the site area to determine if flooding is causing drinking water contamination.

EPA Response: As indicated in Table 6 of the ROD, VOCs were detected infrequently at low levels. Even though some of these compounds were detected in the effluent from the Grant

Gear outfall at higher concentrations, dilution and volatilization quickly reduce the effect of discharge so that downstream and upstream water contaminant levels are approximately the same.

Drinking water in the vicinity of the site is supplied by the MWRA. The source of this water is routinely analyzed prior to distribution. Existing groundwater monitoring wells upgradient of the site along Pellana Road and north of Meadow Brook have not been found to be contaminated. Results of the Phase II sampling of monitoring wells performed during the RI, confirmed that contaminated groundwater is confined to the Grant Gear property. Therefore, exposure to contaminated on-site groundwater would only occur within the Grant Gear property. In addition, water supplied by the MWRA is distributed in pipes under pressure and the potential for outside contaminants to leach into any distribution system is negligible.

Components (e) and (f) of the selected remedy addresses groundwater contamination within the Grant Gear boundaries. Remediation of the groundwater will result in attainment of groundwater and drinking water standards and with implementation of institutional controls, such as deed restrictions, will be protective of human health and the environment.

## C. Comments Regarding Groundwater Contamination

13. One commenter asked if the high water table at the site would increase the likelihood of contaminants spreading into the abutting residential areas when flushing out the PCBs.

EPA Response: The high water table at the site is not anticipated to increase the likelihood of spreading contaminants into the abutting residential areas when flushing out the PCBs. The groundwater extraction system proposed will collect contaminated groundwater flowing from the site towards Meadow Brook and remove the water for treatment. Following treatment to remove contaminants, the treated water will be reintroduced into a groundwater recharge system located on-site to aid in the movement of contaminated water toward the extraction and treatment system. The extraction and recharge systems will be designed to use this recirculating effect to reduce the likelihood of spreading contaminants into the abutting residential areas through the groundwater system.

14. One commenter asked EPA to provide the results of sampling conducted at test wells located at the corner of Hillside and Pellana.

EPA Response: Monitoring well test number 5 is located at the corner of Hillside Drive and Pellana Road. No detectable concentrations of organic contaminants were found in either the deep or shallow well. Inorganic compounds in the well are within expected levels for non-contaminated wells. These wells are used as the upgradient wells to measure against in an effort to identify site related contaminants in downgradient wells. Monitoring well number 6, in the Kerry Place office complex, was also found to be clean.

15. One commenter was concerned that there may be contamination in the groundwater off of Grant Gear and asked if EPA has sampled resident's wells in the area that might have groundwater wells. The commenter also asked if EPA had identified the source of groundwater contamination and if it is industrial in nature.

EPA Response: All monitoring wells sampled beyond the Grant Gear property boundaries were found to be clean. No contamination was found in wells upgradient of the site and therefore, there would be no reason to believe that an upgradient source of groundwater contamination exists which is contributing to the problems at the site. The source of on-site groundwater contamination is assumed to be contaminated soils in former areas of disposal to the west of the Grant Gear Building. Some of the chemicals detected in site media are constituents of solvents used in various manufacturing operations.

16. One commenter asked whether groundwater wells will ever be allowed to be drilled in areas abutting the site.

EPA Response: Groundwater contamination has been detected only in onsite wells downgradient of the source areas. Future risks from groundwater consumption references only that case where a drinking water well was installed onsite in areas of contamination. There is no current data which would prohibit the consumption of offsite water from a drinking water well. Further, groundwater collection and treatment from the site will reduce current groundwater contaminant levels and the possibility of off-site migration. Institutional controls on groundwater consumption will be adopted only in the zone of contamination and are proposed to prevent installation of wells within the on-site zone of groundwater contamination.

Although no evidence indicates that groundwater in off-site areas are contaminated from chemical migration from the site, it will be important to determine the zone of influence for any pumping well installed in close proximity to Grant Gear. Under pumping conditions, an off-site well may impact the groundwater flow and hence the location of the contaminated plume currently detected within the Grant Gear boundaries.

17. One commenter asked EPA to thoroughly clean up contaminated groundwater and surface water at the site.

EPA Response: EPA believes that it is technically infeasible to remove all particulate-bound PCBs from the soils at the site. However, removal of the non-saturated portion of the contaminants will significantly reduce the source of groundwater contamination and when combined with groundwater extraction and institutional controls provides a site remediation which will be protective of human health and the environment. The remediation will also be combined with an environmental monitoring program. Five-year reviews of the remediation will be conducted to ensure that human health and the environment are being protected by the action being taken. Future remedial action will be considered if the long-term environmental monitoring program determines that unacceptable risks to human health and/or the environment are posed by exposure to site contaminants.

## D. Comments Regarding Public Health

18. One commenter requested information about the extent of soil and water contamination at residences near the site. The commenter asked whether it is safe for children to walk barefoot in backyards containing contaminated soils and whether it is safe to eat vegetables grown in neighborhood gardens near the site.

EPA Response: The locations of surface soil samples obtained near residences are shown on Remedial Investigation Figure 2-3. Of the approximately 16 samples obtained, seven contained PCB values above the 1 ppm cleanup target concentration in these areas. These seven samples are identified as sample numbers SO-015, SO-075, SO-017, SO-019, SO-020, SO-021, ans SO-013 on Figure 2-3 of the FS.

Residentail (adult and child) exposure to surface soils in yards located north of Meadow Brook were evaluated in Section 5.2.1.6 (page 5-25) of the Endangerment Assessment. This evaluation considered both dermal contact and incidental ingestion of hazardous chemicals as a result of outdoor activities such as playing and gardening. The plausible maximum exposure through direct contact and incidental ingestion in these areas was estimated to result in a $3x10^{-6}$ lifetime excess cancer risk. EPA determined that remediation of contaminated soils along Meadow Brook would be performed to reduce the risks even further. Residential yard areas having PCB concentrations above 1 ppm will undergo cleanup under the proposed plan.

The additional potential exposure pathway through ingestion of vegetables grown in yards north of Meadow Brook was qualitatively evaluated. This potential exposure pathway was not quantitatively evulated due to uncertainties involving quantifying chemical uptake, quatities grown, and ingestion rates. If residents do consume vegetables grown in their yards, potential exposure can be reduced through simple precautions such as washing and peeling vegetables. Additionally, cooking vegetables may also reduce concentrations of some chemicals in vegatables.

Groundwater contamination has been detected only in on-site wells downgradient of the source areas. There is no current data which suggests that contamination has migrated beyond site boundaries.

19. One commenter asked if the results of the blood tests performed on area residents in June 1989 had been received, and, if so, what the results were.

EPA Response: Individual blood test results will be mailed to those individuals by the Massachusetts Department of Public Health in the near future. After notifying individual residents, a report summarizing the results of the blood testing program will be made available to the public by the Massachusetts Department of Public Health.

### E. General Comments

20. One commenter stated that EPA activities at the site have resulted in the spread of contaminants and stated that EPA is therefore liable to the Town of Norwood for site contamination.

EPA Response: All site activities performed by EPA to collect environmental data were performed using the contaminant reduction zone process. Each sampling tool was decontaminated between samples using a standardized decontamination program to prevent the cross-contamination or spread of contamination from one location to another. All drilling equipment was decontaminated on a decontamination pad as it enters the site, between drill locations and following completion of all field activities. The excess fluids and wash water from the decontamination process were collected and stored in 55-gallon drums for offsite shipment and disposal. All personal protection clothing and disposable sampling equipment was stored in drums for disposal. The contaminant reduction zone process minimizes the potential for the spread of contamination as a result of site activities.

21. Several commenters expressed frustration with cleanup delays and want the most expedient method of cleanup used.

EPA Response: EPA evaluates the times for operation for and implementation of the alternatives when selecting the final remedy. As described in EPA's response to comment A.1., a comparison of the two treatments determined to be effective for on-site soils indicates that the estimated cleanup times for these treatments (solvent extraction, on-site solids by solvent extraction the selected alternative is 4 years; 2 years for design, bid preparation, contract negotiation, bench scale studies, and other pre-implementation activities, and approximately 2 years of field operations.

One of the remedial response objectives for groundwater component is to reduce risks to human health and the environment from current and future migration of contaminants in groundwater within a reasonable time frame. The estimated time of cleanup of the VOCs present at the site in groundwater is estimated at 10 years.

22. One commenter asked how EPA informs residents in the area about the contamination, especially new residents buying homes who know nothing about the site, and wondered why it was not until 1989 that a map of the site area was finally published in the newspaper.

EPA Response: The community relations activities began at the Norwood PCB site in 1983, when the removal action took place. The Region I EPA Office of Public Affairs maintains a mailing list for the site to help keep the community, local officials, and media informed of site activities. This site mailing list is used when mailing out press releases and fact sheets, and is continually updated. For example, when a person moves from an address in Norwood, EPA continues to mail information to the address by changing it to read "Current Resident". In this way EPA hopes to inform new residents of site activities. A sign-in sheet is also available at the entrance to every public meeting that EPA holds, so that people can sign in and let EPA know if they are currently on the mailing list; EPA then adds any names that are not already on the mailing list. In addition, the fact sheets that EPA mails out to the community have a coupon on the back so that names and addresses can be added at any time.

EPA also informs the community of site activities through the information repositories that are set up at the Morrill Memorial Library and the Norwood Town Hall, where fact sheets and site reports are housed for public review. These information repositories are listed in the fact sheets that EPA sends out to everyone on the mailing list to inform them of where to go for site information.

Exhibit A to this Responsiveness Summary lists the community relations activities that have been conducted at the Norwood site over the years.

23. One commenter asked whether cars would still be allowed to be parked on the area of contamination where the cap is coming apart in spots?

EPA Response: Upon completion of the remediation process at the site the surface soils will be remediated to meet the EPA action level and no institutional controls will be imposed on the use of the land surface. Presently, the MA DEP is responsible for the maintenance of the capped areas and will maintain them for their current use until the final remediation is implemented.

24. One commenter asked why EPA has not been in communication with the Norwood Conservation Commission and asked that the EPA clarify whether cleanup activities will comply with the Wetlands Protection Act.

EPA Response: EPA has determined that, for this site, there are no practicable alternatives to the soil excavation, sediment excavation and stream diversion components of the selected remedy, that would achieve site goals but would have less adverse impacts on the aquatic ecosystem. The contaminants in the soils and sediments would continue to pose unacceptable human health and/or environmental risks if excavation of the soils and sediments greater than target levels were not performed. In light of this, during implementation of the remedy, steps will be taken to minimize the destruction, loss and degradation of wetlands, including the use of sedimentation basins or silt curtains to prevent the downstream transport of contaminated sediments. A wetlands restoration program will be implemented upon completion of the remedial activities in wetland areas adversely impacted by remedial action and ancillary activities. Performance of this cleanup remedy will meet or attain all applicable or relevant and appropriate federal and state requirements that apply to the site including Section 404 of the Clean Water Act, Floodplain and Protection of Wetlands Executive Orders 11988 and 11990, respectively and DEP Wetlands Protection Regulations.

As part of the extensive community relations plan, EPA has

**met with local officials, sent out fact sheets and held public meetings on numerous occasions within the last year. A representative of the Norwood Conservation Commission has attended most of these meetings and participated in discussions concerning site activities. EPA will continue to meet periodically with interested parties during the remedial design to discuss new information and design plans. In addition, an informational public meeting will be held when the design is near completion.**

25. **Several commenters expressed confusion about conflicting information they have received from EPA over the years. The commenters stated that they have been told that the emergency removal action in 1983 included the removal of all PCBs at the site.**

EPA Response: The history of the removal action is described below:

On April 1, 1983, the Massachusetts Department of Environmental Department of Environmental Protection (MA DEP), received a telephone call from a citizen living on Pellana Road reporting past industrial waste dumping and contamination in the then vacant field of Kerry Place between Pellana Road and the Grant Gear property. As a result of this call, an initial field investigation by DEP was conducted soon thereafter. On April 6, 1983, DEP sampled surficial soils and Meadow Brook sediments. The initial DEP investigations confirmed PCB contamination in soils. The DEP immediately moved to restrict public access to the field area and marked areas within the Grant Gear fence to alert workers of the possible danger. Because state funds were not available, the Commonwealth of Massachusetts requested EPA to provide support using Superfund money. EPA dispatched their Technical Assistance Team (TAT) Contractor, Roy F. Weston, Inc., of Lexington, Massachusetts, to aid DEP in collecting confirmatory samples of the oil-stained areas along the western fence line and in other areas on both the Grant Gear and Reardon properties. Based on these findings, it was determined that an immediate removal action to address all soils outside the Grant Gear property with PCB concentrations greater than 50 parts per million (ppm) was appropriate. The Agency planned to follow the removal action with a full Remedial Investigation designed to assess the nature and extent of the remaining contamination.

Beginning June 23, 1983, EPA (through their subcontractor, SCA Recycling Industries, Inc., of Braintree, Massachusetts) began removal of contaminated soils on the Site. A total of 518 tons of contaminated soil was removed and disposed at the SCA Model City, New York landfill facility. The soils were removed from locations within the Kerry Place and Grant Gear properties. Reported excavation depths were up to 30 inches. During the removal action, water samples taken from the storm drain system behind the Grant Gear building indicated low levels of PCB contamination. The removal action was completed on August 5, 1983.

## Part II. Summary of Potentially Responsible Party Comments

EPA received and responded to extensive comments from the PRPs. In brief, the main comments are: 1) the EA and FS do not support the need for an active management of migration alternative with respect to groundwater; 2) the recommended cleanup levels of contaminants in soils are inconsistent with levels set by EPA in comparable circumstances and inappropriate in light of the risks associated with those contaminants; 3) the solvent extraction alternative is not cost-effective and EPA did not consider containment alternatives; 4) the target cleanup levels and target risks from which they are derived are based on flawed analysis and are inconsistent with Region I Records of Decision at other PCB sites and EPA guidance documents; 5) the Remedial Investigation and Feasibility Studies contain two critical omissions of data and remedial alternatives concerning the Grant Gear facility; 6) the proposed drainage remedy, while appropriate in its thrust, fails to take into account alternatives while prematurely proposing additional measures; 7) the proposed wipedown of interior plant surfaces is excessive in light of the data in the record; 8) analytical measurements at the site are not realiable; 9) an environmental risk assessment was not conducted; and 10) EPA has mishandled the RI/FS process.

EPA's responses to the PRP's comments are provided in the following section.

## Part II. Potentially Responsible Party Comments

A. Comments from Foley, Hoag, and Eliot on Behalf of Cornell Dubilier Electronics, Inc.

1. There is no justification to state that the federal groundwater protection strategy and drinking water standards are "relevant and appropriate."

   EPA Response: In response to the need to organize and coordinate the various programs that protect groundwater, EPA issued its "Groundwater Protection Strategy" in 1984. Although the Strategy is not a promulgated requirement and therefore would not be a potential ARAR for a Superfund site, it does list several policy statements to be considered when developing a protective remedy. The Strategy outlines a number of specific activities, including issuing guidelines on classifying groundwater for EPA decisions affecting groundwater protection and corrective action. Using the Groundwater Protection Strategy and the EPA Guidelines for Groundwater Classification as, EPA determined that the contaminated groundwater at the Norwood PCB Site falls within Class IIB, (i.e. groundwater that might be used as a drinking water source in the future). In addition to the EPA policy for groundwater classification and protection as outlined in the "Groundwater Protection Strategy", the State of Massachusetts has adopted a groundwater classification system. Under the state classification system, on-site contaminated groundwater has been classified as Class I, potential drinking water source.

   The goal of the Superfund program's approach is to return groundwaters to their beneficial uses. Therefore, for the Norwood PCB Site, one of the goals of the groundwater remediation is to restore the contaminated on-site groundwater to drinking water quality within a reasonable time frame. Based on the on-site groundwater classification and the site-specific groundwater remediation goal, EPA has determined that for this site maximum contaminant levels (MCLs) are relevant and appropriate federal ARARs and Massachusetts drinking water standards are relevant and appropriate state ARARs.

2. A recommendation for the imposition of an active management of migration alternative with respect to groundwater is unwarranted.

   EPA Response: Management of migration response objectives were identified for the Site including the following:

   1. reduce risks to human health associated with potential

future consumption of groundwater;
2. reduce risks to human health and the environment from current and future migration of contaminants in groundwater; and
3. reduce risks to human health associated with potential current and future inhalation of organics released from the site.

The first objective was established in response to EPA's Groundwater Protection Strategy and state and federal groundwater classification schemes, as described in detail in EPA's response to Comment A.1. Based on the on-site groundwater classification and in order to achieve this objective, EPA has determined that MCLs and Massachusetts drinking water standards are relevant and appropriate ARARs. Waivers, including technical infeasibility from an engineering perspective, from complying with these ARARs are not justified for this site.

Results of the RI indicate that a plume of chlorinated organics is moving in the water table aquifer from the western portion of the Grant Gear property, where trichloroethene is found at more than 1 ppm, to Meadow Brook. Chlorinated organics were also detected in bedrock monitoring wells with maximum total chlorinated organics detected at 1.5 ppm. In particular, vinyl chloride was detected in a downgradient well at concentrations of 65 ppb and 110 ppb. The second objective, as listed above, was established to mitigate future migration of contaminants within the site and possibly off-site. Future migration of on-site groundwater, if unremediated, may result in unacceptable risk to the environment and/or human health from exposure to contaminants in Meadow Brook or in groundwater migrated off-site.

The EA evaluated risks to workers at Grant Gear from inhalation of airborne contaminants volatilized from the Site. This evaluation indicates that the risk to workers due to inhalation of vinyl chloride volatilized from groundwater was estimated at $1.9\times10^{-5}$. The third objective, as listed above, was, in part, established to reduce risks to workers from inhalation of airborne contaminants volatilized from groundwater. Achievement of MCLs, including 2 ppb of vinyl chloride, within the aquifer will significantly and permanently reduce risks to less than $1\times10^{-5}$ to Grant Gear workers through inhalation of organics volatilized from the Site.

In summary, an active management of migration alternative, as described in Section X.B.2., has been selected in order to achieve management of migration remedial response objectives within a reasonable time frame. The FS has estimated, a restoration time frame, as defined as achievement of MCLs within the aquifers, of less then 10 years.

3. The imposition of institutional controls obviates the need for evaluation of a groundwater ingestion scenario in the Endangerment Assessment.

   EPA Response: The Endangerment Assessment evaluated a groundwater ingestion scenario as a potential exposure pathway for a future hypothetical resident. This baseline evaluation was conducted in the absence of institutional controls. The purpose of a baseline endangerment assessment is to evaluate potential risks under the no-action alternative (i.e., in the absence of remedial actions including institutional controls).

   As described in EPA's response to comments A.1 and A.2., the groundwater at the site is classified under both state and federal classification systems as a possible future drinking water source. In view of this classification, evaluation of a future groundwater ingestion scenario is appropriate. It should also be noted that institutional controls are never selected when a more protective and effective alternative is available.

4. The proposed groundwater extraction system as designed will not be capable of excluding flow from Meadow Brook and of extracting a significant amount of bedrock groundwater.

   EPA Response: The alternative groundwater extraction systems evaluated in the FS considered the need to protect Meadow Brook against flow reduction. The barrier drain extraction system included in the proposed plan was selected based on its estimated technical feasibility, implementability, and cost-effectiveness in providing this protection. Additional evaluation is planned prior to the final design of the barrier drain system to evaluate the ability of the HDPE liner in preventing Meadow Brook surface waters from entering the groundwater collection system. However, the barrier drain extraction system must be considered as part of the overall groundwater treatment plan which returns treated groundwater to the aquifer system. The combination of the barrier drain extraction system and the reintroduction of treated water into the groundwater system was conceived to aid in balancing the flow relationships of Meadow Brook to prevent flow reduction.

   Prior to installing the barrier drain extraction system, predesign studies will be performed to evaluate implementation issues.

Tests, including permeability tests, will be conducted to evaluate the effectiveness of the HDPE liner in preventing Meadow Brook surface waters from entering the groundwater collection system. Consideration of impacts of surrounding wetlands (i.e. dewatering, groundwater mounding) will be incorporated into the pumping and HDPE liner test designs. If the evaluation of predesign studies determines that the barrier drain collection system would not be implementable or effective, an active pumping extraction system will be used to collect overburden and shallow bedrock groundwater using a series of groundwater extraction wells. The extraction well system was discussed and evaluated in Section 7.2 of the FS, which described a series of nine shallow extraction wells in a line parallel to Meadow Brook. This analysis indicated that the extraction well system would be supplemented with a cutoff wall, such as a slurry wall, in order to control the capture of water flowing in Meadow Brook.

5. The technical feasibility of the proposed recharge system is not demonstrated.

   EPA Response: The recharge field conceptually designed for use in the discharge of treated water is based on conventional technology used in septic system leach fields. This technology has been in use for many years across the United States to effectively manage the discharge of wastewaters to the subsurface. While this is a different use of the technology than domestic wastewater management, the sizing and capacity requirements of the recharge field can be easily modified at low cost, if required, to meet higher or lower flow requirements.

6. Airstripping does not appear to be the most economical alternative because both liquid and vapor-phase activated carbon adsorption will be required.

   EPA Response: As is presented in Tables 7-5 (Air Stripping Costs) and 7-6 (Activated Carbon Costs), the cost of air stripping is approximately $175,000 more than the cost of carbon adsorption (present worth, 5% discount rate). However, the type of conceptual design costing included in a feasibility study is intended to be within a -30/+50 % range. The costs of the air stripping and carbon adsorption alternatives are within 10% of each other, thus, in terms of the accuracy of the cost estimate, these costs can be considered to be identical.

   Estimated present worth costs associated with ultraviolet/oxidation are greater than the costs for air stripping. Any post- or pre-treatment requirements need for air stripping will be equally needed for carbon adsorption and UV/oxidation.

7. A more cost-effective means of removal of PCBs from groundwater could include a filtration system with gradually decreasing mesh sized to remove solids from the groundwater. This technology was not evaluated in the FS.

   EPA Response: All treatment units described in the conceptual design of the ground water treatment process will require some amount of bench scale and/or pilot scale treatability testing to determine that best unit processes to use, sizing and flow requirements, and their most efficient configuration. The filtration system described in the comment (gradually decreasing mesh sizes) can be modeled by a multi-media granular filtration system. This technology was screened in Section 4 of the FS, Identification and Screening of Remedial Alternatives, and maintained as a support technology. This type of filtration would probably be utilized at the end of the treatment train to remove the remaining suspended solids following precipitation. There are several reasons why it was not utilized to remove PCB contaminated solids in the conceptual design of the ground water treatment system. Filtration systems must be periodically back-washed to remove trapped solids. The back-washing requires large amounts of water. This water would be contaminated and would require disposal. As the unit would be the first step of the treatment train, recycle would be impossible and the back wash would require disposal off-site or additional on-site treatment capabilities. The granular media would become contaminated with PCBs and would therefore be very expensive to dispose since it would be required to be placed in a TSCA landfill. If a filtration system of "decreasing mesh sizes" were used, those mesh materials would require frequent replacement or cleaning and would also require expensive disposal. The "sacrificial" carbon units were selected for their ease in maintenance and relatively low cost. They are called sacrificial beds because their sole purpose is to remove PCBs. PCB compounds are extremely susceptible to absorption on solids particles. Very little carbon would be required to remove the majority of the PCB from the water. All other chemicals present would eventually pass through the carbon bed and be treated via the air stripper and precipitation/filtration treatment units.

8. The type of precipitation/filtration process that is considered in the FS is not identified. This process is included at the end of the treatment train, raising question concerning both its technical and effectiveness and its intended purposes.

   EPA Response: All treatment units described in the conceptual design of the ground water treatment process will require some amount of bench scale and/or pilot scale treatability testing to determine that best unit processes to use, sizing and flow requirements, and their most efficient configuration. Typically, precipitation processes result in sludges requiring further treatment, volume or water content reduction, and, ultimately, disposal. The intent of placing the precipitation/filtration process at the end of the treatment train was to reduce the quantity of hazardous chemicals in the water prior to generation of the sludge, resulting in a reduction of the additional sludge treatment required and in the cost of final sludge disposal.

9. The selection of the 1 ppm PCB cleanup target would result in excessive remediation costs not supported by the risk evaluation.

EPA Response: Two scenarios were presented in the EA to evaluate the potential exposure and risk through dermal contact and incidental ingestion of chemicals of potential concern in dredge piles and/or surface soils in on-site areas north of the Grant Gear facility. The first scenario assumes an older child frequents this area and has contact with dredge piles or soils in this area. The second scenario assumes local residents are exposed to chemicals of concern in surface soils in their backyards by outdoor activities such as playing or gardening.

Calculated incremental carcinogenic risks were determined to be greater for a child exposed to contaminated dredge piles or soils in the wooded area north of Grant Gear than for residents contacting contaminated soils in their backyards. The incremental lifetime carcinogenic risks for an older child exposed to contaminated dredge piles and surface soils in the wooded area north of Grant Gear ranged from $2x10^{-6}$ to $6x10^{-4}$. In comparison, for residents contacting contaminated soils in their backyards, incremental lifetime carcinogenic risks ranged from $2x10^{-7}$ to $3x10^{-6}$, reflecting the lower concentrations of chemicals of concern in the residential backyards. In both scenarios, PCBs and total carcinogenic PAHs contribute the majority of the total risk and calculated hazard indices are less than one.

Since no federal or state ARARs exist for soil, the soil target levels for PCBs and PAHs were determined by a site-specific risk analysis. Based on the results of the risk assessment for the protection of residents exposed to contaminated soils in the aforementioned areas, soil and dredge pile cleanup levels of 1 ppm of total PCBs and 2 ppm of total carcinogenic PAHs have been selected. The assumptions used to calculate these soil target levels are presented in Table 14 of the ROD, and reflect the nonrestricted access and residential current and future land use of the areas along and adjacent to Meadow Brook.

As stated above, the Meadow Brook area soil and dredge pile remediation component of the selected remedial action involves excavation of solids, within the unsaturated zone, contaminated with total PCBs at concentrations of 1 ppm or greater, and total carcinogenic PAHs at concentrations of 2 ppm or greater. These clean-up levels will result in a incremental carcinogenic lifetime risk level of $7x10^{-6}$ under both current and future use Site conditions. This risk level is between the $10^{-4}$ and $10^{-7}$ risks levels recommended by EPA guidance and less than the maximum total site risk level of $10^{-5}$ specified in the Massachusetts Contingency Plan.

In addition to setting levels protective of human health, it is of particular note that the soil PCB cleanup level of 1 ppm was selected to be consistent with the Meadow Brook sediment PCB cleanup level of 1 ppm. This consistency will ensure that after the stream remediation, the streamed sediments will not be recontaminated with PCBs due to contaminants in soil eroding into the stream from areas adjacent to Meadow Brook.

10. Insufficient information and calculations are provided to evaluate the validity of the cleanup goals for VOCs in soil.

EPA Response: Soil cleanup goals for volatile organic chemicals (VOCs) were identified to minimize migration of VOCs to groundwater. The site-specific analysis for determining target soil cleanup levels for VOCs used fate and transport modeling to determine levels at which residual VOCs in soils would not leach contaminants to groundwater above groundwater target cleanup levels. Reducing VOCs to the soil target cleanup levels will reduce the time needed for restoration of the aquifer and aid in the attainment of groundwater target levels, including MCLs. Cleanup target concentrations were set to limit potential effects of leaching of chemicals from site soils to the ground water system. Complete information and calculations used as a basis for estimating soil concentrations that would prevent leaching of water from the soils to the ground water system in excess of groundwater target levels including Maximum Contaminant Levels (MCLs) were presented in the Feasibility Study.

11. The proposed cleanup level for PAHs is below "background" levels. This could result in no limit to the areal scope of the remediation.

EPA Response: Total carcinogenic PAH soil target cleanup

EPA Response: Total carcinogenic PAH soil target cleanup levels for soils and dredge piles between Grant Gear's northern fence and Meadow Brook and areas north of Meadow Brook have been set at 2 ppm. For all other on-site soils, a soil target cleanup level of 6 ppm of total carcinogenic PAHs has been established.

As described in the "Supplemental Risk Assessment Guidance for the Superfund Program," EPA, Region I (June, 1989), preferably upgradient samples collected in the field should be used to characterize background levels of contamination. Consistent with this policy, background samples (SO1-100, SO1-044, SD-000, and SS1-005) were collected from various areas in the vicinity of the Site. The background samples collected furthest from the Site are SO1-100 and SD-000 which were collected from Shattuck Park which is located approximately 1.2 miles northwest of the Site. Based on results of analysis of these samples, background concentrations of contaminants in soils in the region of the Site were established and are presented in Table 2-1 of the EA (Ebasco, August, 1989). This table lists a range of Not Detected (<430) - 1,020 ug/kg (1.02 ppm) as the "background" range for total carcinogenic PAHs. Therefore, the PAH soil target cleanup levels specified in the ROD are not below the "background" levels for this site, as determined by analysis of upgradient samples collected in the field.

12. The need for a chemical waste landfill for several source control alternatives including solvent exaction may significantly affect the cost and feasibility of these alternatives.

EPA Response: As described in Section XI.B. of the ROD, EPA has determined that for this Site, placement of soils, sediments and dredge pile materials with PCB levels no greater than 10 ppm under a 10 inch soil cover or asphalt and construction of a groundwater collection trench will provide a permanent and protective remedy that satisfies the requirements of TSCA Disposal regulations (Part 761 landfill regulations). Long-term monitoring of groundwater wells, as described in components (e)(f) and (h) of the selected remedy, will also satisfy requirements of the TSCA landfill regulations.

This determination is based on the Regional Administrator's exercise of the waiver authority contained within the TSCA regulations at 40 C.F.R. § 761.75(c)(4). Specifically, the Regional Administrator determined that, for the Norwood PCB Site, the following provisions of the regulations will be waived and are not necessary to protect against an unreasonable risk of injury to human health or the environment:

1) 40 C.F.R. § 761.75(b)(1) - low permeable clay conditions
2) 40 C.F.R. § 761.75(b)(2) - synthetic membrane liner
3) 40 C.F.R. § 761.75(b)(3) - bottom of liner 50 feet above water table

The soil cover, collection trench and groundwater monitoring are all integral parts of the source control and management of migration components of the selected remedy. Because these components also satisfy the requirements under TSCA § 761.75, no additional costs are warranted based solely on compliance with the TSCA ARAR. As described above, EPA has concluded that based on an assessment of Site conditions and an evaluation of the selected remedy in comparison to requirements specified in 40 C.F.R. 761.75, the construction of a chemical waste landfill is not needed at this Site.

13. The FS did not evaluate any containment alternatives that may provide a high degree of environmental and public health protection at a significantly lower cost than the proposed alternative.

EPA Response: The FS did evaluate in detail a containment option (SC-2 Capping) as a source control alternative. The SC-2 alternative would consist of consolidating outlying contaminated areas, and dredge piles, and sediments under an impermeable cap constructed on-site over the central zone of contamination.

The cap would be designed to serve two purposes:

1. to prevent direct human exposure to contaminated soils and sediments; and
2. to reduce the amount of infiltration through the contaminated soil, thus reducing the potential for contaminants leaching to groundwater.

Although the present worth cost estimated for the containment option (SC-2) is lower than the solvent extraction (SC-3), the containment option was not selected as the source control alternative for remediation of soils, sediments and dredge pile materials. Significant disadvantages associated with containment (SC-2) include the uncertainty of its long-term effectiveness and the potential for future remedial costs and risks to human health and the environment if the cap were to fail. In addition, containment would not address the principal threats posed by such contaminants and would not permanently and significantly reduce the toxicity, mobility or volume of hazardous substances. Finally, volatile organic contaminants in soils would continue to leach into groundwater, thus contributing to groundwater contamination.

14. Several components of the cost estimates appear to underestimate the actual cost. When an appropriate estimate of the actual costs for implementing the solvent extraction alternative is developed, that alternative may not be cost-effective or justifiable.

EPA Response: Cost estimates developed and presented in the feasibility study are a direct result of vendor quotes or have been taken from reliable sources (i.e., Means Site Work) and have been modified to reflect the additional costs associated with handling hazardous material. All alternative costs were developed in the same manner and to the same degree of accuracy. Therefore, a cost increase associated with one alternative will most likely result in an increase in the other alternatives also. The final result of this exercise would be a higher cost for each of the alternatives, yet no change in the cost ranking of each alternative.

15. An overall rejection of all acetone, toluene, methylene chloride and phthalates based on these compounds being common lab contaminants does not seem appropriate.

EPA Response: As stated on page 2-2 of the Endangerment Assessment, a screening analysis was performed to determine the chemical-specific concentrations which would correspond to a lifetime excess cancer risk of $10^{-7}$. These screening concentrations were then compared to concentrations in the site samples, and site-specific concentrations that were lower than the screening concentrations were eliminated from further evaluation because of their negligible impact.

16. The assumption of a zero background concentration for organics may skew cleanup targets beyond background levels.

EPA Response: In preparing the Endangerment Assessment for the Norwood site, site data were compared to available background concentrations. Based on this comparison, numerous organic chemicals were eliminated from the evaluation. Table 2-1 lists the background concentrations used in the endangerment assessment for organic chemicals. This data was collected at the site in areas that EPA believes is representative of background levels. A zero background concentration was not assumed for any of the organic chemicals. In some cases the background concentrations were below the analytical detection limit, but EPA did not assume that non-detected concentrations were zero.

collected.

EPA Response: The scope of the remedial investigation, to include the number of samples collected and the analysis performed was developed through an extensive well defined scoping process. The process began with an assessment of remedial objectives and development of potential remedial alternatives for the site to focus the investigation and increase the efficiencies of the study. The identification of data needs were identified through a thorough investigation of potential site contaminants and potential remedial action related ARARs, preparation of a baseline risk assessment and identification of risk based data needs, and an assessment of site characterization data needs. Based on the data needs identified, the samples were collected to be representative of the site and the analysis performed on the samples was honed through the use of Data Quality Objectives (DQOs). DQOs are qualitative and quantitative goals, in terms of precision, accuracy, representativeness, comparability and completeness which are specified for each data set proposed for collection. Data quality is the degree of uncertainty which can be acceptable in the decisions or conclusions which are derived from interpretation of the data set. The use of this process prevents the investigator from the collection of inefficient samples and the costs associated with the analysis. Based on the use of this process EPA feels that a sufficient number of samples were collected to meet the project requirements for this site.

18. Not selecting a contaminant because it was not elevated in any other areas or media sampled is not appropriate.

EPA Response: As stated on page 2-2 of the Endangerment Assessment, a chemical was eliminated from further consideration if it was detected infrequently in one sample set and either not detected at all or infrequently in other areas and/or media sampled. This criterion is considered appropriate and necessary so that the evaluation would be based on site-related chemicals only. The infrequent detection of a given chemical in a particular sample set coupled with its infrequent or non-detection in other sample sets and/or sampled media indicated that the presence of the chemical at the site would not be considered site-related.

19. It is not appropriate to consider the TSCA PCB Spill Policy as an ARAR.

EPA Response: TSCA's Spill Cleanup Policy is in 40 C.F.R. Part 761 Subpart G. In § 761.120(a) (ii), the policy states that "...old spills which are discovered after the effective date of this policy will require site-by-site evaluation because of the likelihood that the site involves more pervasive contamination than fresh spills and because old spills are generally more difficult to cleanup then fresh spills." Therefore the cleanup policy doesn't supply a standard for "old spills" which occurred before the effective date of the policy, May 4, 1987.

The TSCA PCB Spill Cleanup Policy is designated as "to be considered" (TBC) for the Norwood PCB Site because PCB contamination at the Site occurred before the effective date of the policy. However, in accordance with EPA ARARs guidance, TBCs will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health or the environment. For this site, EPA considered the TSCA PCB Spill Cleanup Policy in determining appropriate target levels and remedial action for PCB contaminated soils and equipment and floor surfaces. EPA's risk assessment indicates that for the cleanup of contaminated equipment surfaces within the Grant Gear building a risk-based target level (5 ug/100 $cm^2$) lower than the Spill Policy cleanup level (10 ug/100 $cm^2$) is warranted to adequately protect Grant Gear workers in direct contact with contaminated equipment surfaces. However, based on the infrequency of exposure to PCB-contaminated floor surfaces within Grant Gear and soils under paved roads outside the Grant Gear property, EPA established a target cleanup level of 25 ppm for contaminated soils under paved roads and a remedial action of decontamination based on the TSCA PCB Spill Policy. Both these measures will be adequately protective of human health and the environment.

20. The Town of Norwood should be partially responsible for dredging costs because of the planned flood control work.

EPA Response: CERCLA § 121 requires selection of a remedial action that is protective of human health and the environment. The Endangerment Assessment examined risks associated with exposure to contaminated sediments in Meadow Brook including direct contact with or incidental injestion of sediments for a child. The highest incremental carcinogenic risk was $5x10^{-5}$, based on direct contact by an older child with the maximum concentrations of contaminants in Meadow Brook sediments. The EA also evaluated potential impacts to environmental receptors exposed to contaminated sediments and concluded that small mammals, rodents and aquatic organisms that inhabit the area, are at risk from exposure to Site contaminants through the skin, by ingestion or through the food chain. Based on results of the EA, EPA has determined that remediation of Meadow Brook sediments is necessary to adequately protect human health and the environment.

The sediment cleanup level for total PCBs has been specified at 1 ppm. This value is based on toxicological literature which documents examples of sublethal toxic effects in aquatic organisms at PCB tissue levels and hence sediment PCB concentrations of greater than 1 ppm. A value of 1 ppm of total PCBs for the protection of environmental receptors is also consistent with other Records of Decision signed within this region. In addition, achievement of the sediment cleanup level will result in significant reduction of risks to children exposed to contaminated sediments in Meadow Brook.

As described in Section X.A.2.C. of the ROD, approximately 3,000 cy of Meadow Brook streambed sediments with contaminants in excess of the sediment cleanup levels will be excavated, from locations near the Grant Gear outfall to the confluence of Meadow Brook and Neponset River. This volume of sediments that will be excavated exceeds the volume necessary to be removed for construction of the Meadow Brook flood control project. Therefore, costs associated with dredging of sediments in accordance with component will justifiably be the responsibility of whomever performs the remedial action selected in this ROD. The town of Norwood, based solely on their flood control project, will not be partially responsible for dredging cost incurred by remedial action described in Section X.A.2.C. of the ROD.

21. The entire issue of water and sediment quality upstream versus downstream of the site and its outfall is not addressed and sources other than the site may exist.

EPA Response: The Remedial Investigation (RI) considered the results of upstream and downstream water and sediment samples as well as the results of water and sediment samples to identify site-related chemicals. Some chemicals in sediments that were found above detection upstream of the Grant Gear discharge pipe but were found downstream and in the discharge pipe at higher concentrations were identified as being partially attributable to the Grant Gear discharge. This was the case with the semi-volatile chemicals 1,2,4-trichlorobenzene and phenol.

22. Semi-volatile contamination in the sediments is only partially attributable to the site. Therefore, remedial costs associated with these compounds should not be completely attributable to the site.

EPA Response: Semi-volatile contamination (PAHs) in sediments was estimated in the RI to potentially be partially attributable to site activities in some urban areas of Medow Brook. The RI further indicated that the sediments in Medow Brook were contaminated with PCBs from areas approximately near the Grant Gear outfall to the Neponset River. As described in Section X.A.1.c. of the ROD, a sediment target cleanup level for PCBs was established. There is no question that PCBs is a chemical of concern at the Norwood PCB Site. No sediment target cleanup level for PAHs was established. While it is true that excavation of the sediments will result in reduction of the PAH levels in sediments, remedial costs relating to remediation of the sediments will be driven by activities relating to the PCB cleanup not the PAH cleanup.

23. The FS does not present evidence that the route of air exposure due to VOCs is complete.

EPA Response: The Endangerment Assessment does discuss the air exposure pathway for VOC release from soils and groundwater and considers the pathways to be complete (see Section 4 of the EA).

24. No rationale is advanced in support of lower cleanup levels for soils and dredge piles between the northern fence and Meadow Brook than for all other soils.

EPA Response: Exposure assumptions used in establishing target levels for soils and dredge piles between the northern fence and Meadow Brook are different than the assumptions used for all other soils. Specifically, soil and dredge pile cleanup levels of 1 ppm of total PCBs and 2 ppm of total carcinogenic PAHs were selected to protect residents exposed to contaminants in soils and dredge piles in areas between the northern fence of Grant Gear and Meadow Brook and north of Meadow Brook. Exposure assumptions used to calculate these target levels are presented in Table 14 of the ROD, and reflect the nonrestricted access and residential current and future land use of the areas along and adjacent to Meadow Brook. These cleanup levels for soils and dredge piles will result in an incremental carcinogenic lifetime risk of $7\times10^{-6}$ under both current and future residential use of these areas.

In addition to setting levels protective of human health, it is of particular note that the soil PCB cleanup level of 1 ppm was selected to be consistent with the Meadow Brook sediment PCB cleanup level of 1 ppm. This consistency will ensure that after the stream remediation, the streambed sediments will not be recontaminated with PCBs due to contaminants in soil eroding into the stream from areas adjacent to Meadow Brook.

For all other soils, including soils within the Grant Gear property, soil cleanup levels of 10 ppm of total PCBs and 6 ppm of total carcinogenic PAHs were selected to protect workers exposed to contaminants in soils in areas within Grant Gear and other commercial properties. Exposure assumptions used to calculate these target levels are presented in Table 14 of the ROD, and reflect the nonrestricted access and commercial current and future land use of these areas. These levels will result in an incremental carcinogenic lifetime risk level of $1x10^{-5}$ under both current future use Site conditions.

25. The basis for the 175 ppb cleanup goal for total 1,2-dichloroethenes is not presented.

EPA Response: As stated in the Proposed Plan for the Norwood PCB Site, "groundwater cleanup goals for the site were based on the federally - established MCLs, health effects assessments and the State of Massachusetts groundwater standards". In particular, the cleanup levels established for total cleanup levels established for total 1,2-dichloroethenes and 1,2,4-trichlorobenzene were based on the site-specific health assessment for the protection of human health from adverse noncarcinogenic effects due to ingestion of groundwater contaminated with those chemicals. Each target level reflects a hazard index (HI) of 0.5, for a combined HI of 1.0.

26. The non-RCRA cap should be eliminated because of unreliability and the RCRA cap retained.

EPA Response: Based on the evaluation of screening criteria, the RCRA cap was eliminated and the non-RCRA cap was retained. As was presented in Section 4 of the FS, and discussed in detail in Appendix A of the FS, implementation of the RCRA cap would have a detrimental effect on the future uses of the property and the Grant Gear building. The building is surrounded on three sides by PCB contaminated material. A multi-layered RCRA approved cap is typically at least 4 feet thick and may be as much as 7 feet thick depending upon the final approved design. The placement of a RCRA cap on the site would not allow the continued use of the building as many exits including the loading docks in the rear of the building would be precluded from use. Additionally, the contamination is directly adjacent to the building, which would require the cap to be placed directly against the building walls. It is doubtful if the walls could withstand the added pressure placed upon them by the multi-layered cap. The non-RCRA cap, while admittedly requiring a greater amount of maintenance, would not effect the future use of the site or the building. The non-RCRA cap would result in an elevation change of approximately one foot which would not greatly affect the building functions. The asphalt cap would be designed to building functions. The asphalt cap would be designed to support a typical parking lot which would increase the uses of the site property, much of which is currently being used for parking. The asphalt cap is easily repaired through standard construction maintenance, and the HDPE liner incorporated into the cap design would mitigate the volume of precipitation reaching the contaminated soil in between the periodic cap repair.

27. Costs estimated for the lining of Meadow Brook appear low including handling costs, analysis costs, costs associated with clearing and cost for dam construction, pipeline and sediment curtains.

EPA Response: Cost estimates developed and presented in the feasibility study are a direct result of vendor quotes or have been taken from reliable sources (i.e., Means Site Work) and have been modified to reflect the additional costs associated with handling hazardous material. The costs presented in Tables 6-3, and 6-4 are the estimated costs of lining Meadow Brook from just above the Grant Gear outfall pipe to the confluence with the Neponsett River, after the sediment containing PCB concentrations exceeding the indicated level have already been removed. For example, Table 6-3 presents the estimated cost to line Meadow Brook given the 10 ppm excavation scenario. Therefore, all sediment material containing PCB concentrations greater than or equal to 10 ppm have already been removed. The costs presented include the additional clearing and grubbing, and the access road needed to reach the lower portions of the stream in order to remove the additional material necessary to allow construction of the liner. These costs are not included in Table 6-4, the 1 ppm excavation scenario, because it is assumed that the material containing 1 ppm concentrations of PCB or greater have already been removed, thus the access road construction and additional clearing required have already been performed. Since both scenarios assume that contaminated material has already been excavated, there is no need to include the costs of bypass pipes, sediment curtains, and analyses, as these will already have been done.

In addition to the above discussion, the comment appears to be concerned with the unit costs used for several of the site activities. Item I.5 of Table 6-3 is the cost of spreading and compacting material on the site. The cost of loading the trucks and hauling the material to the site is included in the excavation and stockpiling cost. The costs of disposing the material containing PCB concentrations less than 1 ppm assumes that this material may be disposed as clean fill, thus the majority of the cost reflects the anticipated cost of transporting the material to a site accepting clean fill.

28. The cost estimate for excavation and stockpiling appears to be very low.

EPA Response: The cost estimate for soil excavation and stockpiling is based on costs taken from Means Site Work, and modified to include a health and safety factor. It should be noted that excavation will only be to the water table (8 feet), and the majority of the excavation is within the top 5 feet of soil. Actually, much of the contaminated area is only 1 to 2 feet deep, thus, the excavation will be simple and fairly routine. Although proper respiratory equipment will most likely be required, it is not anticipated to slow down equipment operators a significant amount. Depending on the site layout that will be developed in the design phase, and the phasing of the excavation,stockpiling, and treatment, excavation costs may be higher than estimated if excessive double handling of material is required. If the cost estimate for the excavation and stockpiling is higher than estimated, the contingencies applied to the capital cost are more than sufficient to cover any additional costs.

29. Costs estimated for the groundwater extraction system appear low, including excavation costs and unanticipated variations in bedrock elevations.

EPA Response: Cost estimates developed and presented in the feasibility study are a direct result of vendor quotes or have been taken from reliable sources (i.e., Means Site Work) and have been modified to reflect the additional costs associated with handling hazardous material. Variations in the depth of bedrock were utilized in determining the volume of material required to be excavated. The type of conceptual design costing included in a feasibility study is intended to be within a -30/+50 % range. Assuming the trench excavation cost presented is low, doubling the excavation cost adds less than 10 % to the total cost of implementing the barrier drain trench, and it is still much more cost-effective than the well extraction system and slurry wall option.

30. The costs of vapor phase carbon appear overestimated whereas, costs for the sacrificial carbon bed appear underestimated.

EPA Response: The costs presented for the vapor phase carbon and the sacrificial carbon bed are the result of direct conversations with carbon vendors. It was difficult to develop the costs for the vapor phase carbon since the air stripper has not been fully designed, and the chemical concentrations of the air phase effluent of the air stripper have not been determined. However, vapor phase carbon systems are commonly much more expensive than aqueous phase carbon systems, and the volatile chemicals expected to exist in the air phase effluent will have relatively fast carbon saturation rates resulting in high carbon usage. On the other hand, the sacrificial carbon bed will have a very low carbon usage rate as it is designed solely for removal of PCB, which is readily adsorbed onto the activated carbon. All other chemicals present would be allowed to saturate and pass through the sacrificial bed to be treated via the air stripper. The low PCB concentrations present in the water, and the relatively low flow rate will not require the utilization of a large carbon unit.

31. The placement of metals removal at the end of the treatment train, while offering the potential for production of a less hazardous sludge can cause operation problems.

EPA Response: All treatment units described in the conceptual design of the ground water treatment process will require some amount of bench scale and/or pilot scale treatability testing to determine that best unit processes to use, sizing and flow requirements, and their most efficient configuration. The precipitation/filtration process was placed at the end of the water treatment train because it would result in a less hazardous sludge which may require less treatment and be less expensive to dispose. The ground water would require acidification prior to treatment via the activated carbon unit and the air stripper to mitigate the potential of precipitation clogging either treatment unit. After air stripping, the treated water would be neutralized and returned to its natural pH prior to recharge of the treatment effluent to the ground water. This neutralization may cause some precipitation of metals forming sludge. Additionally, there may be biological growth in the air stripper that will slough off into the effluent. This will also require filtration. Thus, some type of filtration unit may be required at the end of the treatment train, regardless of the treatment configuration.

As stated above, results of treatability studies or pilot studies will be evaluated to determine the best overall design for the air stripper and other treatment components and the need for pre- and post-treatment units, including acidification and carbon polishing unit, thay may be necessary to meet all required discharge regulations. These results will also yield information on the percent reduction of organic and inorganic compounds in groundwater and the volume and types of residuals and byproducts produced by the operation of the groundwater treatment system.

## B. Comments from Morgan, Lewis and Bockius on behalf of Federal Pacific Electric Company

1. Region I's use of a "maximum plausible risk assessment methodology" is not a scientifically validated technique and its use is inconsistent with EPA Headquarters Guidance for conducting public health evaluation.

   EPA Response: The Endangerment Assessment used a single set of exposure parameters with both mean and maximum concentrations for the chemicals of potential concern where appropriate. The exposure parameters used in the evaluation ranged from average to plausible maximum values. Thus, this evaluation did not use maximum plausible values exclusively. The use of plausible maximum values in the Endangerment Assessment is consistent with EPA Headquarters guidance and operational practice.

2. The Aroclor mixture at the site was reported to be largely Aroclor 1254. Therefore, it is unreasonable to use the same cancer potency factor for these mixtures as one would use for Aroclor 1260.

   EPA Response: EPA guidance does not provide Aroclor-specific cancer potency factors for PCBs. Instead a general cancer potency factor is provided for PCBs that is based on studies of Aroclor 1260. This number is intended to represent all PCBs when quantifying the potential health risks from any PCB mixture or Aroclor.

   Use of the potency factor for Aroclor 1260 is consistent with the "Supplemental Risk Assessment Guidance for the Superfund Program" (EPA Region I, June 1989).

3. The risk assessment treats all carcinogenic PAHs at the site as having the old cancer potency factor of benzo(a)pyrene. As a result, the Agency has been able to grossly inflate the risk estimates for human contact.

   EPA Response: The use of the benzo(a)pyrene cancer potency factor as a surrogate for all known and suspected carcinogenic PAHs is consistent with current EPA guidance and operational procedures. It is done in the absence of EPA validated health criteria for other PAHs besides benzo(a)pyrene (B[a]P).

   As stated in EPA Region I guidance. Use of the carcinogenic potency factor of B[a]P for carcinogenic PAHs may result in overestimation of risk because B[a]P is considered to be one of the most potent of the carcinogenic PAHs, and B[a]P is likely to constitute only a fraction of the mixture of carcinogenic PAHs present at a site. On the other hand, many other PAHs that are not routinely analyzed for at Superfund sites may have carcinogenic potential. Thus, this approach may not account for some carcinogenic PAH costituents because they haven't been identified or classified by EPA as having carcinogenic potential.

4. Analyzing PCBs individually and summing for reporting purposes is a questionable methodology resulting in skewing of information on the material present at a particular site.

   EPA Response: This methodology was used for evaluating the potential health effects associated with PCBs at the site. As stated in the response to comment B.2, the EPA has established only one health criteria number for PCBs. Therefore, it is a common risk assessment practice to sum all PCB aroclors in a particular sample in order to assess the potential health impacts for the entire mixture of PCBs detected at the site. This is currently the only way to quantitatively evaluate all PCBs detected at the site.

5. Use of the linear multistage model for risk assessments is inappropriate for assessing risk form chemicals like PCBs based on biological considerations.

   EPA Response: The use of the linear multistage model for quantifying potential health risks associated with exposures to PCBs is consistent with current EPA guidance and operational practices.

6. Human experience demonstrates that the PCB cancer prediction model is overconservative.

   EPA Response: While the conservative nature of the PCB cancer prediction model is open to scientific debate, its use in the Endangerment Assessment is consistent with EPA guidance and operational practices.

7. Potential exposures within the Grant Gear facility are within OSHA allowable limits. Thus, it is difficult to understand why EPA proposed such extensive cleanup of this area when the exposures fall within legally established limits.

   EPA Response: Indoor air samples collected on May 28, 1989 within the Grant Gear building, detected PCB Aroclor-1254 ranging from 1.5 ug/m$^3$ to 3.7 ug/m$^3$. These detected levels were well below OSHA's threshold limit value-time weighted average (TLV-TWA) concentrations of 500 ug/m$^3$.

   The degree to which sources of PCBs within and outside the Grant Gear building contribute to airborne PCB levels cannot be exactly quantified. However, based on the results of the

RI, the following media may be contributing sources:

1) contaminated soils in the exterior of the building,
2) contaminated sediments and water within the drainage system, and
3) contaminated surfaces within the Grant Gear building.

An evaluation of potential risks to workers from inhalation of volatilized PCBs from soils (assuming no indoor source) resulted in an incremental carcinogenic risk of $3x10^{-6}$. Therefore, EPA believes it is reasonable to remediate possible indoor sources so that predicted risk levels are not significantly increased.

The selected remedy includes remediation of surfaces of equipment, machinery and floors within the plant areas of the Grant Gear building. EPA believes that remediation of such surfaces is necessary to protect workers both in the short- and long-term. The rationale behind this selection is presented below:

1) As described in the EA, Grant Gear worker exposure through direct contact with mean and maximum PCB concentrations detected on equipment surfaces resulted in an incremental carcinogenic risk of $2x10^{-5}$ and $5x10^{-5}$, respectively. Based on the site-specific risk assessment, the cleanup level for Grant Gear machinery and equipment surfaces has been set at 5 ug/100 $cm^2$ for total PCBs. Remediation of all equipment to this cleanup level will result in a maximum risk of $1x10^{-5}$ workers due to exposure to contaminated machinery and equipment surfaces inside Grant Gear.

2) EPA has determined that as a source control measure, decontamination of the floor surfaces is necessary to minimize the potential for migration of PCBs into the air, and subsequent recontam- ination of equipment and machinery. Therefore, decontamination of floor surfaces is necessary to adequately reduce long-term risks to workers for exposure to contaminated surfaces. In addition, this measure at a relatively low cost will further reduce, to the extent that PCBs on the floor volatilize into the air, the risks to workers associated with inhalation of PCBs.

Comments on the Proposed Plan received during the public comment period, indicated that the selected remedy should include decontamination of floor surfaces within the Grant Gear building. Specifically, comments submitted on behalf of Grant Gear, indicates the need to address PCB contamination of the floor as a source of contamination inside the building. Additional comments from the public have expressed the need to "prevent risk to humans by eliminating all organic contaminants from the site." Finally, the state of Massachusetts has expressed a preference for remediation of the contaminated floors within Grant Gear in order to restore conditions at the Site, to the extent feasible. Therefore, inclusion of decontamination of floor surfaces into the selected remedy as a source control measure is consistent with EPA's guidance on the selection of a remedy in that it addresses submitted state and community concerns as part of the state and community acceptance criteria.

8. The Agency's failure to ensure the integrity of the sampling data casts serious doubt on EPA's analytical finding and conclusions.

EPA Response: All EPA activities are performed under an exhaustive Quality Assurance/Quality Control program from sample collection and shipment through analysis and data validation. Samples are collected with duplicates and method blanks and matrix spike duplicates are prepared for analysis. Sample shipments to the laboratory include travel blanks, equipment blanks and matrix blanks. The validation procedure evaluates holding time, instrument calibration, laboratory blank results, ICP interference checks, spike recovery results, laboratory duplicates, field duplicates, laboratory control samples, detection limits, serial dilutions, instrument time, surrogate spike recovery, instrument performance and compound identification. It is because of this program that EPA is able to ensure the integrity of the data collected. The mobile laboratory used at the Norwood PCB Site was subject to much the same QA/QC as a standard CLP laboratory, and was subject to an independent QA/QC audit. Approximately 24 percent of all samples (104 samples) analyzed by the mobile laboratory were analyzed by the CLP for confirmational analysis. A regression analysis performed on the data found a high correlation coefficient (0.945) and found significant correlation at a confidence level greater than 99.5 percent. Where minor problems were identified through the validation procedure was in the CLP generated data. These problems were a result of low level contamination by the laboratory of the samples with extractant solvents resulting in very few of the samples being either rejected or qualified as estimated, where appropriate. Estimated values also include concentrations of contaminants which were detected at concentrations above the instrument detection limit but below the CRQL. Notes on the tables in the data evaluation portion of the RI relative to the use of data collected prior to the remedial investigation were inserted to provide a baseline of data to scope the project around. If data collected by a previous investigation did not meet the requirements and data needs identified in the scoping process, it was noted to be unacceptable and no decisions were made based on the data.

9. Unreasonable assumption were used to evaluate risks to workers at the site including: a) implausibility that workers would not wash or wear protective clothing; b) unlikely soil exposure through landscaping or material storage; and c) inappropriate soil adsorption factor.

   EPA Response: EPA considers the exposure factors used in the Endangerment Assessment to be reasonable. It is true that in some cases these factors may represent a conservative approach to the exposure level. The resulting Endangerment Assessment represents at worst a maximum plausible exposure assessment of the potential health risks. With regard to the soil absorption factors, EPA used a factor of 0.05 for PCBs and PAHs, and a value of 0.5 for all other organic chemicals evaluated.

10. Unreasonable assumptions were used to evaluate risks to children playing in the brook including: a) unreasonable soil ingestion rate; b) failure to take credit for vegetative cover.

   EPA Response: The soil ingestion rate used in the Endangerment Assessment (50 mg/day) is within the values published in the EPA's Exposure Factor Handbook (1988) for children from 5-18 years of age with an intermediate to high tendency to ingest soil. This data is based on considerable experimental data. With regard to vegetative cover, EPA does not believe that the cover is of a nature to prevent soil contact. Therefore, the vegetative cover was not considered in the evaluation of potential health risks associated with this pathway.

11. EPA's groundwater exposure assessment is based on a model which assumes that PCBs are dissolved in groundwater and volatilization can be determined by application of Henry's constant. However, the model does not account for the ability of PCBs to bind to particulates and not dissolve in groundwater. The model also overestimates the indoor air concentration of PCBs inside the facility.

   EPA Response: The model used to estimate volatilization from groundwater assumed that the PCBs were dissolved in the groundwater. However, the evaluation of this pathway looked at volatilization from both groundwater and soil. In the soil volatilization analysis the equilibrium partitioning did account for the propensity for PCBs to bind to soil particles. The chronic daily intake (CDI) associated with soil volatilization was approximately 50 times greater than the CDI associated with the groundwater volatilization.

Therefore, the risks associated with PCBs for this pathway are driven by soil volatilization, and the effect of assuming all PCBs are dissolved in the groundwater has no impact on the risk number.

With regard to the overestimation of the indoor air concentration of PCBs inside the facility, the Endangerment Assessment presents a discussion of a comparison of predicted to measured air concentrations of PCBs inside the Grant Gear facility which showed that the predicted concentration was ~4 times higher than the average measured value. An agreement within a factor of 4 between measured and modeled air concentrations based on short-term (8-hour) average air concentrations is generally considered a reasonable agreement, due to the fluctuating nature of air concentrations in the short term. Therefore, EPA believes that the long-term air concentration estimates provided by the modeling are representative of the air concentrations inside the Grant Gear facility.

12. It is not credible to assume that the aquifer would replace the municipal water supply or that if it did, that water would be untreated.

EPA Response: As described in detail in EPA's response to comment A.1, the groundwater cleanup approach for the Site is based upon EPA's Groundwater Protection Strategy and federal and state groundwater classification schemes. This approach which incorporates classification of on-site groundwater as a potential future drinking water source is consistent with EPA's guidance on remediation of groundwater. Under EPA's guidance documents and policies, it is credible to assume that the aquifer would replace the municipal water supply, for potable and non-potable uses and that if it did, that water would be untreated. Of particular note is the continuing increased demand for water supplies, thus negating the approach to "write off" aquifers that are currently on municipal water supply systems, through implementation of no action alternatives.

13. EPA's analysis is flawed with respect to changes in the land use of the industrial park at the site to residential housing.

EPA Response: As stated in the "Supplemental Risk Assessment Guidance for the Superfund Program", EPA Region I (June 1989), Region 1 has maintained the position that future land use at most Superfund sites could be residential. Based on this guidance, the EA evaluated exposure scenarios for Grant Gear and adjacent commercial properties under a future residential use. However, EPA, in consultation with the state, have determined that for this

**site it is highly unlikely that areas within Grant Gear and adjacent commercial properties will ever be rezoned for residential use. Therefore target ceanups levels for soils located at Grant Gear and surrounding commercial properties were based upon protection of workers from exposure to contaminated soils, reflecting the current and future commercial use of this area.**

14. **The Agency failed to conduct an environmental risk assessment of the site.**

    EPA Response: Chapter 6 of the Endangerment Assessment provides a detailed environmental assessment of the site.

15. **The lack of a baseline on the flora or fauna will make it difficult, if not impossible, for EPA to attain the stated goals of wetlands mitigation/restoration/enhancement.**

    EPA Response: Environmental characteristics of the wetland in Meadow Brook was investigated and the results presented in Section 3.6 of the Remedial Investigation. As part of this assessment, the nature of the wetland in Meadow Brook was described through identification of flora and fauna and evaluation of the hydrologic characteristics of the wetland habitats. An environmental risk assessment was performed and presented in the Endangerment Assessment using site-specific information on wetland flora and fauna identified during the on-site evaluations.

16. EPA has improperly determined that an environmental risk existed at the site based on a sediment quality criteria number.

    EPA Response: In response to growing concerns on the effects contaminated sediments have on the Nation's waters, EPA has been actively pursuing the development of numerical sediment quality criteria (SQC). The regulatory authority to develop SQC has been given to EPA by the Clean Water Act of 1977, its reauthorization in 1987 and other legislation. This effort has been conducted in cooperation with numerous Agency Offices, contractors and university scientists.

    A variety of approaches have been proposed to develop SQCs, three of which are being considered for numerical SQC on a national level: a water quality criteria approach, an approach involving equilibrium partitioning (EP), and an approach involving body burden effect relationships (bioassays). The EP approach currently has had a substantial amount of scientific and economic support. Preliminary SQC have been derived for several contaminants including PCBs using this method.

The EP methodology was reviewed by the Sediment Criteria Subcommittee of the Science Advisory Board in February, 1989. Supporting documents provided to the Board indicate that sensitivities of benthic species are sufficiently similar to those of water column species to tentatively permit the use of water quality criteria for the derivation of sediment quality criteria for non-polar organics by the equilibrium partioning approach. Thus, while it is EPA's opinion that any one method that assesses sediment contamination would not be sufficient to address all contaminated sediment problems, the EP approach in establishing SQC presently has enough scientific validity to justify its use in environmental risk assessments to assess endangerment to aquatic organisms exposed to contaminated sediments.

Site-specific SQCs for PCBs, based on the EP approach, were compared to contaminant sedimentary levels to determine environmental risks at the Norwood PCB Site. In this case, the use of the SQCs as a to-be-considered (TBC) is appropriate because no federal or state ARARs exist for assessing risk or establishing target cleanup levels for contaminated sediments. As stated in the ARARs guidance document "CERCLA Compliance with other Law", in many circumstances TBCs will be considered along with ARARs as part of the site risk assessment. The guidance further specifies that cleanup goals for some substances may have to be based on nonpromulgated criteria and advisories rather than on ARARs when ARARs do not exist for those substances.

17. EPA's selection of cleanup goals rests on a highly questionable interpretation of EPA's PCB Spill Policy.

EPA Response: The selection of cleanup levels for the Site was consistent with EPA's guidance documents including "CERCLA Compliance with Other Laws Manual" and "Guidelines in the Superfund Public Health Evaluation Manual." EPA's response to comments A.19. describes the rationale on the use of TSCA PCB Spill Policy in the selection of cleanup levels for floor surfaces and soils under paved surfaces. EPA believes that consid- eration of the TSCA PCB Spill Policy in establishing such cleanup levels was appropriate.

18. EPA's commitment to spend $2 million on control of pollutant migration is arbitrary and capricious. CERCLA's preference for treatment is not so overriding that it can be used to overcome a situation of technical infeasibility, particularly in a situation where there is a municipal water supply.

EPA Response: Control of further mirgration of contaminants in groundwater is only one of three remedial response objectives set for the management of migration alternatives. A detailed explanation of all management of migration remedial response objectives and the rationale behind EPA's selected groundwater collection and treatment components of the selected remedy is presented in EPA's responses to comments A.1 and A.2.

19. EPA has violated the 404 guidelines by failing to prepare an analysis of the viability of other practicable remediation alternatives to excavation of the brook which would not destroy the habitat.

EPA Response: The Feasibility Study (FS) addressed a range of potential remedial actions including containment of sediments, excavation of sediments and minimal no-action which would not involve excavation of sediments. Each of these potential remedial actions was evaluated according to the criteria identified in the FS. In addition, evaluation of the alternatives considered the existing plans of the Town of Norwood to perform modifications to Meadow Brook for the purposes of flood control. Based on this evaluation and analysis, EPA has determined that, for this site there is no practicable alternative to excavation that would achieve site goals but would have less impact on the aquatic ecosystem. Unless soils and sediments greater than the target levels are excavated, the contaminants in the soils and sediments would continue to pose unacceptable human health and environmental risks.

20. The selection of solvent extraction technology for this site contravenes CERCLA and the NCP. Solvent extraction cannot be said to be more readily implementable and cost-effective than other technologies considered since its implementability is currently unknown, and the technology has not been tested.

EPA Response: The analysis of solvent extraction technologies was based on the selection of solvent extraction using triethylamine (TEA) as a representative process option. Solvent extraction using TEA has been applied to the on-site treatment of petroleum re-refining sludges containing PCBs at the General Refining Co. site in Savanna, Georgia during 1986-1987. An EPA report of that full-scale application indicated that bench-scale treatability studies showed good correlation with full-scale results. The vendor of the TEA solvent extraction process has completed over 80 bench-scale treatability tests on waste materials. As indicated in the FS, bench-scale treatability study results performed on a variety of soils by the vendor of the TEA solvent extraction technology were used in the evaluation of technical feasibility. This information was deemed adequate for EPA to decide that the solvent extraction technology could perform adequately over a range of soil conditions and concentrations and that order of magnitude cost estimates (i.e. +50/-30 percent) required for the FS could be made. Since site-specific media samples were not used in the vendor's treatability studies, a site-specific pilot-scale treatability study was included as a pre-design task of the selected remedy to verify attainment of extraction efficiencies and performance necessary to meet cleanup objectives.

21. To perform pilot studies of remedial technologies that are candidates for site cleanup after a ROD is signed is inconsistent with NCP and CERCLA and an arbitrary and capricious action on the part of the Agency.

EPA Response: The Superfund Remedial Design and Remedial Action Guidance Manual (OSWER Directive No. 9355.0-4A) indicates in Section 2.3.2. that remedial actions involving on-site treatment or disposal of contaminated wastes may require additional studies to supplement the technical data available from the RI/FS so that the optimum treatment or disposal methods may be determined. Additional studies could include bench and pilot scale studies. Since treatability studies were not conducted during the RI/FS, these additional studies on solvent extraction will be conducted as part of remedial design/remedial action (RD/RA) for the source control portion of the remedy.

The Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive No. 9355.3-01) indicates in Chapter 5 that the decision to conduct treatability must be made by weighing the cost and time required to complete the investigation against the potential value of the information in resolving uncertainties associated with selection of a remedial action. In some situations, treatability investigations may be postponed until the remedial design phase. The decision process for treatability investigations includes 1) determining data needs, 2) reviewing existing data on the site and available literature on technologies to determine if existing data are sufficient to evaluate alternatives. The Guidance further states that pilot-scales studies should be limited to situations in which bench-scale testing or field sampling of physical or chemical parameters provide insufficient information from which to evaluate an alternative. Because of the time required to design, fabricate, and install pilot-scale equipment and to perform tests from a reasonable number of operating conditions, conducting a pilot study can add significant time and cost to the RI/FS.

For the Norwood PCB Site, EPA believes that the existing particular, described in Chapter 6 of the FS (Ebasco, 1989), available test data on the effectiveness of the solvent extraction process from treatability studies performed on PCB-contaminated wastes were presented in the detail evaluation of solvent extraction. EPA believes that for this Site, an evaluation of test data from treatability studies on solvent extraction performed on wastes similar to solids found at the Site and existing site characterization data provides sufficient information from which to evaluate alternatives without the need to perform a pilot study during the RI/FS. Therefore, conducting a pilot study on solvent extraction during the RI/FS would have added an unreasonable time delay. A pilot study will be performed as part of the source control component of the remedy. In general, data necessary for remedy selection is distinct from that required for remedial design. Performing treatability studies at every Superfund site during the RI/FS for a significant number of remedial alternatives would be extremely time-consuming and expensive.

22. The FS fails to analyze other remedial technologies in the detail that is required for screening including bioremediation.

EPA Response: The Feasibility Study presented the results of technology screening at the site based on effectiveness, implementability, and relative cost. The screening was performed according to Section 300.68 of the National Contingency Plan (NCP), in conjunction with the EPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive 9355.3-01, Interim Final, October 1988). The summary results of technology screening are presented in Chapter 4 of the FS. Detailed screening of the remedial technologies identified in Chapter 4 of the FS are presented in FS Appendix A. EPA believes that the FS for the Norwood PCB site adequately screened alternatives. In particular, bioremediation technologies were screened out because the uncertainties associated with these "emerging" technologies were greater than solvent extraction and other innovative technologies. The problems associated with bioremediation are:

1. Maintenance of the proper environment for the micro-organism populations;

2. High energy requirement to break down large complex molecules such as PCBs. This translates into longer retention times to complete the reaction;

3. Without agitation provided by a reactor, mass transfer is greater reduced, thus reducing the speed and

effectiveness of the reaction;

4. Variable soil conditions of the site may result in inconsistent flushing, thereby limiting direct contact between micro-organisms and contaminants (PCBs), and;

5. If bioremediation was implemented using landfarming technique, large areas of land would be needed to set up and maintain these plots. As stated in the FS and the ROD, the land surrounding the Norwood site is predominantly wetland resource areas and commercial properties thus, limiting the implementability of certain technologies requiring large areas of land, including bioremediation.

23. There appears to be a number of inconsistent estimates of the quantity of soils that are contaminated at the site, which cast doubts on the cost estimates for the cleanup.

EPA Response: The initial calculations of the soil volume at the site were developed for various PCB concentrations including 10 ppm, 25 ppm, 50 ppm, 100 ppm, and 500 ppm, and for various depths including surface soils only, excavation to the ground water table, and complete excavation of all contaminated material. Thus, a matrix of volumes and associated costs had to be developed for each proposed site activity dependent upon the selected cleanup concentration and depth of excavation. In narrowing these various volume calculations down to the selected cleanup level, EPA made several decisions regarding cleanup concentrations, depth of excavation, and associated assumptions that differed from the assumptions used to originally calculate the soil and sediment volumes presented in the RI report. These assumptions included:

o The PCB target level within the Grant Gear property was set at 10 ppm, and the target level north of the Grant Gear fence, along Meadow Brook, was set at 1 ppm.

o The uncontained portions of zones B, C, and D will be excavated.

o Only soils and sediments contaminated with PCBs above 10 ppm will be treated. Those soils and sediments with PCB concentrations between 1 ppm and 10 ppm will be placed on the Grant Gear property as fill.

o The maximum depth of excavation will be to the ground water table which is estimated to be approximately 8 foot below grade across the site.

When a decision was reached as to the selected PCB cleanup

When a decision was reached as to the selected PCB cleanup criteria, and the depth of excavation at the site, the volumes were recalculated and rechecked. Thus, the volumes and costs presented in the Final FS are correct. These volumes are as follows, noting that the soil volume includes the dredge pile material:

Total soil and sediment volume to be treated (PCB > 10 ppm)
= 28,455 cy

Total soil and sediment volume to be placed on site without treatment (PCB >1, < 10 ppm)
= 5,090 cy

Total soil and sediment volume requiring excavation
= 33,545 cy

The proposed plan and the ROD may present a rounded figure of these volume estimates.

24. Unit rates used in the cost estimates for all soil/sediment remediation alternatives appear to be at the low end of estimated ranges, thus assuming best case operating conditions and results.

EPA Response: Cost estimates developed and presented in the feasibility study are a direct result of vendor quotes or have been taken from reliable sources (i.e., Means Site Work) and have been modified to reflect the additional costs associated with handling hazardous material. All alternative costs were developed in the same manner and to the same degree of accuracy. The costs associated with the standard construction activities (i.e., excavation, materials handling, etc) were all increased by a safety factor to account for increased health and safety conditions necessary for work with hazardous material. When vendor quotes were used, as in the case of the solvent extraction, incineration, and dechlorination costs, a cost slightly higher than the middle of the quoted range was utilized. In addition, the type of conceptual design costing included in a feasibility study is intended to be within a -30/+50 % range and should not be considered final as there may be many things overlooked at the conceptual stage that will become apparent during design of the alternative. The costs presented at the FS stage are merely used as a comparison between potential remedial alternatives. Since all the alternatives have been developed to the same degree of accuracy, an increase in the costs of all the alternatives would not change their cost-effectiveness in relationship to each other.

25. The groundwater remediation technology is based on only one

set of groundwater elevations.

EPA Response: Groundwater elevations in the water table and bedrock aquifer systems were measured on May 11, 1988, August 11, 1988, March 15, 1989 and April 4, 1989. The results of the measurements obtained at these times were presented on Table 2-3 of the RI. Results from the series of ground water elevation measurements performed were plotted and showed similar trends in flow direction and gradient. Seasonal variation in ground water elevations were considered in the formulation and evaluation of the ground water remediation technologies during the FS.

26. Given the levels of PCBs in the stream and the cost estimate for constructing the liner, it seems wholly unreasonable to pursue this particular remedy.

EPA Response: EPA concurs with the determination that major disadvantages are associated with construction of a liner in Meadow Brook as a source control alternative. Specifically, containment of Meadow Brook by construction of a liner would not comply with the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility and volume of wastes. There is also an uncertainty in the long-term effectiveness of a containment option and the possibility of future risks and costs if the liner were to fail. Based in part on the reasons described above, EPA did not select construction of a liner in Meadow Brook as the source control alternative for remediation of contaminated sediments.

27. The fact that EPA contemplates a pilot study, with a default position causing incineration to be substituted at some later date if solvent extraction proves to be infeasible for the site, is an arbitrary and capricious mishandling of the RI/FS process.

EPA Response: As explained in EPA's response to Comment B.21., EPA believes that performing a pilot study on solvent extraction as part of remedial design/remedial action is consistent with guidance documents including "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (OSWER Directive No. 9355.3-01).

Furthermore, the "Interim Final Guidance on Preparing Superfund Decision Documents" (OSWER Directive No. 9355.3-02) states that where an innovative technology is selected and its performance potential is to be verified through additional testing conducted during RD/RA, a proven treatment technology may be included in the Proposed Plan and ROD as a contingency remedy. In the event that test results indicate that the innovative technology will not fulfill its performance expectations at that site or operable unit, the contingency remedy could be implemented.

As described in the FS and Section XI of the ROD, based on the performance potential of solvent extraction, this innovative technology provides the best balance of tradeoffs from among the options considered, despite its uncertainties. Congress provided support for selecting innovative technologies in such instances in CERCLA section 121(b)(2), which states:

> The President may select an alternative remedial action meeting the objectives of this subsection whether or not such action has been achieved in practice at any other facility or site that has similar characteristics.

28. Few, if any, tests have been conducted with the RCC B.E.S.T. process to assess its contacting and extraction efficiency. Several scale up issues cannot be addressed in small scale test.

    EPA Response: The BEST solvent extraction process has been utilized in a full scale cleanup at a Superfund site in Savannah, Georgia. In addition, RCC has completed over 80 bench-scale treatability tests with a variety of waste material and contaminants. Reported PCB removal efficiencies are typically greater than 99%. RCC is also currently operating a pilot-scale unit at their facility in Bellevue, Washington. Comparison of data between the bench-scale and full-scale operations at the Savannah site indicated a good correlation between the two, thus, scale up from bench-scale to full-scale is not anticipated to be a problem. While existing bench scale test results on a variety of soils and PCB concentrations have indicated adequate removal efficiencies for site concentrations, treatability tests will be performed on the material existing at the site prior to the final design of the remedial alternative.

29. An incremental 20% allowance (in addition to the base contingency of 20%) should be included for solvent extraction given the limited commercial experience it has compared to incinerators.

    EPA Response: The solvent extraction process does have limited commercial experience. Treatability tests would be required to ensure that the process will treat the site soil and sediment to the specified concentration levels. If the process is proven to be effective in treating the site materials, the actual treatment of the material is not expected to pose exceptional problems. The site activity anticipated to be the most troublesome will be the materials handling and preparation required prior to the utilization of any of the solids treatment options. Both the solvent extraction and incineration process require solids to be screened and over-sized solids to be either crushed or disposed via an alternate method such as landfilling. This solids preparation process is often difficult and may be costly, however, the process would be very similar for both the solvent extraction and incineration treatment operations, thus, both options have identical scope contingency factors.

30. Fugitive dust emission can be a problem with the dry solids produced in the RCC process.

EPA Response: Water from the solids is separated and collected during the operation of the RCC process. This water is passed through a carbon adsorption unit to remove contaminants. Prior to discharging the treated solids, a portion of this treated water is mixed into the solids to bring the water content to approximately 10%. This mitigates the potential fugitive dust emissions problem, and creates a material that is much easier to handle.

31. The observation that on-site incineration is readily implementable overstates the current state of knowledge and is an abdication of EPA's responsibility in overseeing the RI/FS process.

EPA Response: Based mostly on the limited availability of vendors for the solvent extraction and dechlorination treatments, on-site incineration is described as readily implementable when compared to the other treatments (solvent extraction, dechlorination) evaluated in detail in the FS.

Both pilot and full-scale mobile PCB incinerators are available and have been used successfully at other hazardous waste sites. Experience with this technology is more extensive than that of the innovative technologies.

EPA owns a mobile rotary kiln incinerator which consists of specialized equipment mounted on 4 trailers. System performance is monitored through instruments and automatic safety shutdown controls. This mobile unit has demonstrated a greater than 99.9999% destruction and removal efficiency at a trial burn on liquids and solids contaminated with dioxins. It has been operated over the past 2 years for cleanup of dioxin-contaminated liquids and soils from numerous dioxin sites in Missouri. To date, over 2 million pounds of solids and 18,000 gallons of liquids have been processed.

Ogden Environmental Services, Inc. owns and operates a mobile circulating bed combustor incinerator for the treatment of hazardous wastes. Test results from the company's pilot plant indicate that the TSCA requirement for 99.9999% destruction and removal efficiency was achieved for soil contaminated with 10,000 ppm of PCBs.

Under EPA's Superfund Innovative Technology Evaluation (SITE) program, a full-scale and a pilot-scale infrared system have been demonstrated. The full-scale system demonstration was conducted at the Peake Oil Superfund site in Florida. A total of 7,000 cubic yards of waste material contaminated with PCBs and lead was processed. During the trial burn that was conducted, extensive sampling was included for the solid waste feed, stack gas, ash, scrubber liquid and water influent, scrubber effluent solids, and ambient air. The final technical report on the demonstration will document the entire mechanical operating history of the system and the problems that were encountered in operating this type of full-scale system. The pilot-scale system demonstration was conducted at the Rose Township - Demond Road Superfund site in Michigan. Approximately 10 cubic yards of contaminated soils were treated utilizing a blend of the most highly PCB- and lead-contaminated soils at the site. The final technical report will document information similar to the full-scale demonstration.

32. Additional analysis of the types of incinerators and problems with each needs to be conducted before incineration could be selected as a treatment technology at this site.

EPA Response: As stated in EPA's response to comment B.21, EPA believes that the existing database is adequate to support EPA's remedy selection of on-site incineration as the backup treatment for the remediation of soils, sediments and dredge pile materials. Identified concerns regarding the types of incinerators and problems with each needs are concerns that may be addressed during the remedial design process, and are not essential to the remedy selection of on-site incineration (back-up treatment).

Incineration is a proven technology which will meet ARARs and will be protective of human health and the environment. Although design work is needed, there is no basis for any expectation that new information will change EPA's conclusion.

EPA agrees that incineration is not appropriate at every site. EPA considered a variety of factors in determining that incineration could achieve the desired clean-up goals at the Norwood PCB Site. These factors included:

1. Variability of waste feed composition: Variability in particulate size will be addressed by design of appropriate pretreatment and materials handling processes. Variability in feed contaminant concentrations will be addressed by soil blending, particularly in cases where extremely high PCB concentrations are found.

2. Nature of contamination: There is not historical evidence of disposal of metal-bearing wastes. Contaminants identified at the Norwood PCB Site are predominantly organic and are suited to destruction by thermal treatment. EPA does not believe there are high levels of metals at the site. Appropriate design of air emissions controls and ash disposal practices can be imposed to address metals levels.

3. Depth of contamination: Soil excavation below the water table becomes complex and expensive and generally complicates material handling procedures. Soil moisture content affects the fuel consumption rate of the incinerator. EPA believes that limiting excavation to the water table for the majority of the site addresses a number of technical implementation concerns.

4. Climate: A mobile incinerator may be more susceptible to climate considerations than stationary incinerators located in close proximity to the site. However, appropriate weatherproofing (e.g., temporary structures to protect the incinerator, area of excavation, and/or materials handling and preparation area) would mitigate climatic impacts. EPA does not consider the weather to be an insurmountable obstacle to the implementation of on-site incineration.

Other factors which will need to be considered during remedial design of the incinerator include, but are not limited to, the following: non-combustible fraction of solids, fraction of ash as particulate; combustible solids heating value; incinerator and afterburner operating temperatures; and residence time. Treatability testing will be required to determine appropriate operating parameters for the incinerator as well as ash/decontaminated soil handling procedures.

C. Comments from Mintz, Levin, Cohen, Ferris, Glovsky and Popeo, P.C., on behalf of Grant Gear

1. The target cleanup levels recommended in the Ebasco FS are based on unsupported risk targets.

PCB-contaminated soil on the Grant Gear property are based on a target excess lifetime cancer risk of $10^{-5}$. The exposure assumptions used in the Endangerment Assessment for direct contact under future land use conditions were combined with the PCB cancer potency factor of 7.7 $(mg/kg\text{-}day)^{-1}$ to determine the target cleanup level for PCBs in soil. The use of the 7.7 $(mg/kg/day)^{-1}$ cancer potency factor is consistent with current EPA guidance and operational procedures. The EPA Carcinogen Assessment Group (EPA 1989. Integrated Risk Information System [IRIS]. Environmental Criteria and Assessment Office, Cincinnati, Ohio) calculated the oral potency factor of 7.7 $(mg/kg\text{-}day)^{-1}$ for PCBs used in the Endangerment Assessment and cleanup level calculations. This number was intended to represent all PCBs when quantifying the potential health risks from any PCB mixture. Therefore, the calculated target cleanup level for PCBs, which is based on the use of a 7.7 $(mg/kg\text{-}day)^{-1}$ cancer potency factor for PCBs, is supported by current EPA guidelines.

2. The soil cleanup target level of 10 ppm appears to have been chosen with the objective of maximizing the amount of cleanup rather than with any associated risk in mind.

   EPA Response: The PCB cleanup level of 10 ppm is a risk-based level based on the site-specific risk assessment. Potential exposures and risks were assessed for workers, through dermal contact with and incidental ingestion of chemicals of potential concern in surficial soils at commercial properties within the site boundaries. The maximum incremental carcinogenic risk for a worker in the vicinity of the Grant Gear facility, coming in contact (landscaping, storing) with contaminated surficial soils was $8 \times 10^{-3}$. Total PCBs and total carcinogenic PAHs contribute the majority of the total risk. Based on the results of the site-specific risk assessment for the protection of workers of Grant Gear and adjacent commercial properties, soil cleanup levels of 10 ppm of total PCBs and 6 ppm of total carcinogenic PAHs have been selected. The assumptions used to calculate these soil target levels are presented in Table 14 of the ROD, and reflect the manufacturing current and future land use of this area.

   Reducing the concentration of residual contaminants to these levels will result in an incremental carcinogenic lifetime risk level of $1 \times 10^{-5}$ under both current and future use site conditions.

3. The RI/FS and EA address surface and air contamination within the Grant Gear building but the RI/FS and proposed remedies completely disregard the source of this contamination.

contamination.

EPA Response: As described in EPA's response to Comment B.7., the degree to which sources of PCBs within and outside the Grant Gear building contribute to PCB level detected in the air and on equipment surfaces within the Grant Gear building cannot be exactly quantified. However, based on the results of the RI, the following may be contributing sources: 1) exposed contaminated soils in the exterior of the building; 2) contaminated sediments and water within the drainage system; and 3) contaminated surfaces with the Grant Gear building.

The selected remedy addresses all suspected sources, as described above, of surfaces and air PCB contamination within the Grant Gear building. These source control components are described below: 1) component (b) of the selected remedy - excavation, treatment, on-site disposal, of contaminated soil within the Grant Gear property and soil covering and revegetation or repaving of excavated areas; and 2) component (d) of the selected remedy - flushing and/or containment and replacement of portions of the Grant Gear drainage system and decontamination of contaminated machinery, equipment and floor surfaces within the Grant Gear building.

4. By failing to address the source of PCB contamination, EPA has in effect chosen a No Action alternative with respect to this source which seems to assume the building will operate as a cap.

EPA Response: As described in EPA's response to Comment C.3., EPA believes that the selected remedy addresses all identified sources of PCB contamination of equipment surfaces and of airborne PCB levels within the Grant Gear building.

With respect to soils beneath the building, site investigations have indicated on average relatively low levels of PCBs, when compared to all other soils within the Grant Gear property. A maximum value of 99 ppm of PCBs was detected in soils beneath the building. This value is greater than soil target levels of 10 ppm PCBs and 25 ppm PCBs established for soils on Grant Gear and adjacent commercial properties and for soils outside the Grant Gear property under paved areas, respectively. EPA has determined that because of extreme disruption to and damage of the Grant Gear building, it is impracticable to remove Grant Gear's floor in order to remediate the underlying soils. Instead, EPA's selected remedy incorporates institutional controls which will be designed to ensure disturbance of untreated subsurface soils beneath the Grant

EPA believes this approach is protective of human health and the environment because no risk is associated with these contaminated soils based on incomplete exposure pathways.

5. The proposed wipedown remedy requires continuing operations and maintenance that are difficult to control over time.

   EPA Response: Comments submitted on behalf of Grant Gear, indicate that a wipedown and wet-sweeping floors measures performed within the plant have been effective in reducing PCB levels within the plant. EPA believes that component (d) of the selected remedy which includes solvent washing of floor and equipment surfaces will be equally effective in reducing indoor PCB levels.

   As an additional ensurance of the long-term effectiveness of the decontamination of floor and equipment surfaces, 5 year reviews performed at the site will include wipe sampling of equipment and floor surfaces within the plant areas of Grant Gear. Future remedial action, including source control measures, will be considered if the long-term monitoring program determines that unacceptable risks to human health and/or the environment are posed by exposure to site contaminants.

6. The FS omits the possibility that, at some point, the Grant Gear building will either partially or totally be demolished which would present significant technical difficulties in demolishing and disposing of building structures.

   EPA Response: As described in Section VII of the ROD, the preferred alternative, as described in the Proposed Plan has been amended to include decontamination of floor surfaces. Therefore, the selected remedy specifies a number of components relating to remediation of the Grant Gear building including decontamination of equipment and floor surfaces and flushing/cleaning and containment of the drainage system. Any disposal of building structures in the future would have to be performed in accordance with state and federal regulations. EPA anticipates that any residual PCB levels on building structures would not be greater than 50 ppm and not subject to TSCA PCB Disposal regulations.

7. To the extent that any contamination of the floor slab is greater than or equal to 50 ppm, the remedy selection does not meet EPA TSCA regulation or its PCB Spill Cleanup Policy, respectively.

   EPA Response: As described in component (d) of the selected remedy, decontamination of floor surfaces within the plant areas of the Grant Gear building will be performed according to requirements specified in the EPA TSCA PCB Spill Cleanup to requirements specified in the EPA TSCA PCB Spill Cleanup Policy, 40 C.F.R. 761, Subpart G. In particular, floor surfaces will be cleaned by double washing with an appropriate solvent and rinsed to an appropriate performance standard, as measured by the standard wipe tests.

The PCB Disposal Requirements promulgated under TSCA do not require the removal of PCBs and PCB Items from service and disposal for disposal occurring prior to the effective date of the regulations. However, these regulations are applicable to PCB-contaminated solid and liquid wastes generated as a result of decontamination of contaminated surfaces. All solid wastes generated from decontamination of surfaces will be treated in an off-site incinerator meeting the standards of 40 C.F.R. § 761.69.

8. RCRA requirements for closure and post-closure should be adhered to with respect to the concrete plant floor.

   EPA Response: RCRA Regulations for floor surfaces are not applicable nor relevant and appropriate because levels on floor surfaces are not sufficiently similar to hazardous wastes under Massachusetts Hazardous Waste regulations. Rather, the cleanup levels specified in the TSCA PCB Spill Cleanup Policy have been designed to apply to contamination of floor surfaces and matches the circumstances of the site.

9. The potentially devastating impact on Grant Gear raises a question whether the remedies involving soil excavation are implementable.

   EPA Response: It is recognized that the space available for use on the Grant Gear property is limited. The availability of work space was considered in the Feasibility Study when evaluating alternatives involving soil excavation. As a result of these evaluations, staging of soil excavation and treatment activities will be carefully planned during remedial design to reduce the short-term and long-term impact on Grant Gear operations. During the remediation process, some temporary modification of existing land use within the Grant Gear property can be anticipated. However, the temporary modifications in existing land use required during soil excavation were not deemed severe enough or of a sufficiently long duration to preclude implementation or business relocation.

10. The FS is deficient in failing to consider relocation of Grant Gear as part of response action by EPA or the Federal Emergency Management Agency.

    EPA Response: The Grant Gear Building FS (CDM, August 1989) identified and screened seven response alternatives. Of these alternatives, Alternative B-6 consisted of Demolition of the Grant Gear building. Although not explicitly stated, relocation of Grant Gear would be a component of this alternative. Given the total destruction of the building, relocation of the Grant Gear business would be required on a long-term or permanent basis depending upon the feasibility and cost of reconstructing a building on-site upon successful implementation of the remedial action.

The other six alternatives identified in Chapter 4 of the FS would not incorporate relocation of Grant Gear as a component because these alternatives would not result in damage to the building to the extent that the building would be uninhabitable.

11. The remedy should include the permanent relocation of Grant Gear.

EPA Response: The terms "remedy" or "remedial action" is defined under CERCLA § 101(24) to include costs of permanent relocation of residents and businesses where the President determines that, alone or in combination with other measures, such relocation is more cost-effective than and environmentally preferable to the transportation, storage, treatment, destruction, or secure disposition off-site of hazardous substances, or may otherwise be necessary to protect the public health or welfare.

This alternative would not be more cost-effective than other alternatives evaluated because relocation alone would not result in any reduction of current on-site risks but would be excessively costly. There is no advantage to be gained by such relocation, based on its effectiveness, because contaminant levels within the building would not be reduced to acceptable target cleanup levels. If demolition of the building was combined with relocation of Grant Gear, excessive costs would be associated with demolition of all building structures and disposal or decontaminated of roofs, walls, drainage piping, floors and other building structures and combined with the costs of relocation would be orders of magnitude greater than other alternatives evaluated in the FS. Additional disadvantages associated with demolition are as follows:

1) off-site disposal of building least preferred under CERCLA
2) implementability constraints relating to the logistics of demolishing a large building contaminated with residual levels of PCBs
3) transportation and disposal constraints associated with handling of significant volume and mass of building structures.

Comments submitted on behalf of Grant Gear, state that a decision to provide permanent relocation may be based on findings that exposure, to hazardous substances from the site after remedial actions, has a significant likelihood of causing or contributing to adverse health effects or exacerbating existing conditions.

EPA has determined that the selected remedy, as described in Section X. of the ROD, will be protective of human health. The remedy at this Site will permanently reduce the risks presently posed to human health and the environment through:

1) solvent extraction of PCBs and other contaminants in soils, sediments and dredge pile materials and off-site incineration of PCB-contaminated oil extract;
2) flushing and containment of PCB-contaminated sediments in the Grant Gear drainage system to prevent further contamination of Meadow Brook;
3) decontamination of equipment and floor surfaces within the Grant Gear building;
4) extraction and treatment by air stripping of contaminated groundwater to contain the contaminant plume and restore groundwater quality; and
5) institutional controls.

Treatment of contaminated soils and dredge pile materials will reduce risks associated with exposure to contaminants from direct contact with and ingestion of soils and dredge pile materials from a maximum incremental carcinogenic risk of $8 \times 10^{-3}$ at Grant Gear to less than $1 \times 10^{-5}$. In addition, 10 inches or clean soil will be placed over areas where treated soils will be disposed to further reduce the potential risks associated with direct contact with or ingestion of site contaminants.

The Grant Gear office and machinery equipment surfaces cleanup level to be attained by the decontamination of these surfaces, will reduce risks to Grant Gear workers in direct contact with such surfaces to a maximum carcinogenic risk of $1 \times 10^{-5}$. Reducing the levels of floor contaminants will minimize the potential for migration of PCBs into the air, and subsequent recontamination of equipment and machinery. The combination of flushing and containment of the Grant Gear drainage system will virtually eliminate the continued release of hazardous substances to Meadow Brook, especially PCBs, so as not to recontaminate the stream sediments and reintroduce the risks from sediments that are being remediated by this remedy.

Risks from exposure to contaminated groundwater, via ingestion, will be permanently and significantly reduced as a result of groundwater collection and treatment. Cleaning the contaminated groundwater at this Site will promote restoration of groundwater quality and prevent off-site migration of contaminated groundwater. EPA has determined that it is technically infeasible to attain a health-based groundwater cleanup level for PCBs. Groundwater within the zone of contamination is not currently used for drinking water sources. Institutional controls will be implemented to ensure that in the future, drinking water wells will not be drilled within the zone of PCB groundwater contamination.

EPA believes that there is not significant likelihood of causing or contributing to adverse health effects or exacerbating existing conditions once remedial action is complete. Therefore, based on this determination and all other reasons stated above, relocation of Grant Gear is not justified.

12. The ROD should allow enough designing flexibility to accommodate differences between the ENSR proposal (Grant Gear's contractor) and the CDM proposal (EPA's contractor).

    EPA Response: As stated in the comments submitted by Grant Gear, ENSR's conclusions and recommendations are conceptually in accord with those of the principal remedy for the drainage system (flushing/cleaning). As part of the soil component of the remedy, EPA has also specified that best management practices and engineering measures, such as installation of curbing and sweeping of pavement surfaces will be taken to prevent further contamination of Grant Gear's drainage system including roof surfaces. Specific measures and implementation requirements will be finalized during remedial design.

13. The ROD should allow for incorporation of a requirement greater than the limits of detection for PCBs if that should be adopted instead.

    EPA Response: EPA, in consultation with MA DEP, established a cleanup level of 0.5 ppb of total PCBs in the effluent from the Grant Gear drainage system. This value is based on a practical detection limit for the analysis of PCBs and was specified in Grant Gear's draft National Pollutant Discharge Elimination System (NPDES) permit proposed in 1988.

    As stated above, the PCB cleanup level of 0.5 ppb was based on the achievable detection limit for the analysis of PCBs in surface and its value is approximately 35 times the PCB ambient water quality criterion of 0.014 ppb. Given this comparison, EPA believes it is unlikely that a requirement greater than 0.5 ppb would be acceptable. However, if EPA in consultation with the Massachusetts Division of Water Pollution Control (MDWPC) determines that, after ROD signature, a greater target cleanup level for the drainage system would be acceptable, then, the ROD may be changed as a minor change or a significant change.

The decision process relating to such changes to the ROD changes to the ROD is described below: Minor changes, such as the decision to move the location of a well or minor cost or time changes, are those technical or engineering changes that do not significantly affect the overall scope, performance, or cost of the alternative and fall within the normal scope of changes occurring during the remedial design/remedial action engineering process. Such changes should simply be documented in the post-decision document file and, optionally, can be mentioned in a remedial design fact sheet, which is often issued as part of the community relations effort.

Significant changes to the remedy in terms of scope, performance, or cost are explained in an Explanation of Significant Differences provided for under CERCLA Section 117(c). This document describes the differences and what prompted them and is announced in a newspaper notice. This is placed in the administrative record for the site, along with the information that prompted the change. Significant changes involve a component of the remedy, such as a change in the volume of contaminated ground water that must be addressed, or a switch from air stripping to carbon adsorption in a ground-water pump and treat remedy, but do not fundamentally alter the hazardous waste management strategy represented by the selected remedy.

14. The effectiveness of flushing and the implementability of additional contingent measures depend on completion of soil and groundwater treatment.

    EPA Response: As described in component (b) of the selected remedy, measures will be taken during implementation of the soil component to limit potential air emissions from excavation, treatment and ancillary activities. In addition, best management practices and engineering measures, such as installation of curbing (berms) and sweeping of pavement surfaces, will be taken to prevent further contamination of Grant Gear's drainage system including roof surfaces. Specific measures and implementation requirements including optimal sequencing of the soil, groundwater and drainage system will be finalized during remedial design.

15. The ROD should adopt a more flexible, staged approach to the remediation of the drainage system, including retesting and

additional source measures applied.

EPA Response: The ROD establishes what measures will be taken to remediate the site to protective levels. EPA acknowledges there are numerous factors to be considered before implementing the extensive site remedy, as specified in Section X of the ROD. The appropriate sequence of implementation of the various components of the selected remedy will be finalized during remedial design.

16. There is not reason to believe that the roof is a significant source of contamination within the drainage system or that roof drains have accumulated a significant volume of contaminated sediments. Therefore, the existing roof drains can be connected directly to a new above-grade exterior drain.

EPA Response: Investigations performed by EPA indicated that gravel that cover the asphalt roof of the Grant Gear building was contaminated with PCBs in the range of 1.8 to 3.1 ppm. In addition, sampling and analyses of roof water performed by ENSR, Grant Gear's consultant, indicated PCB levels ranging from 0.27 to 2.7 ppb. Because the established Grant Gear drainage system cleanup level is 0.5 ppb, the results, as described above, are of significance. EPA has determined that additional sampling is necessary to further determine PCB levels on the roof and in roof drains. Based on these results, appropriate remedial actions will be performed, including if necessary replacement of roof drains and sealing of the roof.

17. The objectives of the containment remedy can be achieved more effectively by sealing points on inflow and outflow, without the additional labor and material cost of filling and sealing the entire system.

EPA Response: As described in component (d) of the selected remedy, containment will implemented were flushing and cleaning are ineffective in reducing contaminant levels to target levels. For those portions that will be contained, the entire portion will be filled with concrete of a slurry mixture (e.g. bentonite slurry). EPA did not select containing only the inflow and outflow because of the uncertainty of the long-term effectiveness of uncontained portions of the drainage system in preventing future release and migration of contaminants.

18. It is unnecessary to clean the drainage system and then also fill it with concrete.

EPA Response: The cleanup standard under §121(b)(1) mandates that remedial actions in which treatments which permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants as a principal element, are to be preferred over remedial actions not involving such treatment.

In the case of remedial alternatives for remediation of the Grant Gear drainage system, EPA selected flushing and cleaning followed by treatment of the purged solids over containment because flushing and cleaning will permanently and significantly reduce the volume, toxicity and mobility of the hazardous substances. Containment would not utilize treatment and would only reduce the mobility of hazardous substances.

Containment of the drainage system will be the backup alternative if flushing and cleaning is ineffective in reducing contaminant levels to target levels. To what extent containment would be necessary will be determined during remedial design and remedial action.

19. Careful attention needs to be given in remedial design to insure protection of drainage area during soil excavation.

EPA Response: As described in components (b) of the selected remedy, measures will be implemented to limit potential air emissions from excavation, treatment and ancillary activities. In addition, best management practices and engineering measures, such as installation of curbing (berms) and sweeping of pavement surfaces, will be taken during soil excavation, treatment, storage and disposal activities to prevent further contamination of Grant Gear's drainage system including roof surfaces.

20. The ROD should provide for resampling of roof and any other exterior drainage source and measures consistent with the drainage remedy in the event that any areas have been recontaminated during remedial action.

EPA Response: The selected remedy specifies methods to be implemented to minimize further contamination of the Grant Gear drainage system. EPA believes these measures will be effective in minimizing further migration of contaminants into the drainage system. As with any component, sampling will be performed to determine how effective these measures were in meeting the response objective.

21. EPA's study fails to support decontamination of equipment surfaces in both the office and plant. The record reveals that no decontamination is required in the office portion of the building.

EPA Response: EPA concurs that the record does not support decontamination of equipment surfaces in both the office and plant areas of the Grant Gear building. Component (d) of the selected remedy specifies that only machinery/equipment and floor surfaces within the plant areas of the Grant Gear building will be remediated.

22. The decontamination of surfaces component of the remedy will result in cleaning up too many surfaces too low a level and is therefore neither cost-effective nor considered with ARARs.

EPA Response: The PCB target cleanup level for equipment and machinery surfaces is a risk-based level of 5 ug/100 $cm^2$. This level was based on the site-specific human health risk assessment and was established to be protective of Grant Gear workers in direct contact with contaminated surfaces. Remediation of all equipment to this cleanup level will result in a maximum risk of $1x10^{-5}$ workers due to exposure to contaminated surfaces. Assumptions used to determine this target level is presented in the EA and is consistent with the "Supplemental Risk Assessment Guidance for the Superfund Program" EPA Region I (June 1989).

With respect to ARARs, no federal or state ARARs exist for establishing target cleanup levels for contaminated surfaces. As described in EPA's response to comment A.19, the TSCA PCB Spill Policy is not an ARAR but a TBC. EPA did consider the surface cleanup level of 10 ug/100 $cm^2$ specified in the TSCA PCB Spill Policy but determined that the site-specific risk-based level of 5 ug/100 $cm^2$ was necessary to adequately protect workers exposed to contaminated surfaces.

# EXHIBIT A
# COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE NORWOOD PCB SITE

## COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE NORWOOD PCB SITE

EPA has conducted the following community relations activities at the Norwood PCB site:

- June 22, 1983 - EPA attended an emergency meeting held by the Town to discuss the status of soil removal activities at the site.
- July 1983 - EPA issued a press release announcing that contaminated soil would be removed from the site.
- July 1987 - EPA met with local officials to describe field investigation activities and the status of negotiations with PRPs.
- March 1988 - EPA sent letters to residents living in the Meadow Brook area regarding the initial results of sediment and surface water sampling activities.
- March 3, 1988 - EPA issued a press release announcing that a March 16 public meeting would be held to discuss the 2-phase RI/FS being conducted for the site.
- March 16, 1988 - EPA held a meeting to discuss the RI/FS.
- November 1988 - EPA distributed a fact sheet summarizing field investigations conducted to-date and explaining opportunities for public involvement during the site investigation and cleanup process.
- March 8, 1989 - EPA met with the Norwood Board of Selectmen to present a status report on groundwater investigations being conducted as part of the RI. This was one of many quarterly meetings sponsored by the Town that EPA attended and provided information about the site related issues.
- June 8, 1989 - EPA issued a press release announcing that a public meeting would be held to explain the results of the RI and EA.
- June 15, 1989 - EPA held a public informational meeting to present the results of the RI and EA.
- August 3, 1989 - EPA issued a press release announcing an August 10 public meeting and an August 24 public hearing to present the FS and Proposed Plan. The notice also stated that a 30-day public comment period would be held, and that the Administrative Record would be available at site information repositories so that the documents could be reviewed.
- August 1989 - EPA distributed copies of the Proposed Plan to those on the site mailing list prior to the August 10

meeting.

- August 10, 1989 - EPA held a public informational meeting to present the FS and Proposed Plan.
- August 24, 1989 - EPA held an informal public hearing to accept comments on the FS and Proposed Plan.
- August 11, 1989 through September 9, 1989 - EPA held public comment period on the FS and Proposed Plan.

# EXHIBIT B
# TRANSCRIPT OF THE AUGUST 24, 1989 INFORMAL PUBLIC HEARING

UNITED STATES OF AMERICA
ENVIRONMENTAL PROTECTION AGENCY
REGION ONE

In the Matter of:

PROPOSED CLEANUP PLAN FOR THE
NORWOOD PCB SUPERFUND SITE

Thursday
August 24, 1989

Memorial Hall
Norwood Town Hall
Washington Street
Norwood, Massachusetts

The above-entitled matter came on for hearing, pursuant to Notice, at 7:37 o'clock p.m.

BEFORE:

RICHARD CAVAGNERO, Chairman
Chief
Massachusetts Superfund Section
U.S. EPA
90 Canal Street
Boston, Massachusetts 02114

RICHARD G. MCALLISTER, Esq.
U.S. EPA, Assistant Regional Counsel

JANE DOWNING
U.S. EPA, Project Manager

DALE C. YOUNG
Massachusetts Dept. of Environmental Protection
Site Manager

# I N D E X

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| Plan recap | Ms. Downing | 7 |
| Public comment | Attendees | 21 |

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# PROCEEDINGS

COMMENCED [7:37 p.m.]

MR. CAVAGNERO: Good evening. I guess we are going to get started.

My name is Richard Cavagnero. I work for EPA. I am the Chief of the Massachusetts Superfund Section and I'm responsible for the remediation of superfund sites in Massachusetts that make it to the National Priority List.

Let me introduce the people sitting up here with me. At the far end here is Jane Downing who is the Remedial Project Manager for EPA for the Norwood PCB site. Next to me is Dale Young who is the Site Manager for this site for the State Department of Environmental Protection. And to my left is Richard McAllister who is the attorney for EPA on this particular site.

Also in the audience we do have some representatives from EPA's contractors who worked on the Remedial Investigation Feasibility Study including Rick Gleason from Ebasco, our prime contractor, and Jack Frost and Henry McLean from ICF, the subcontractor.

The purpose of the hearing tonight is to take formal comments for the record on the proposed

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plan EPA has issued for the Norwood PCB site and also on the feasibility study in general, remedial investigation and endangerment assessment.

The format of the hearing is fairly simple. Jane will be giving a short recap, ten or fifteen minutes on the proposed plan, which she discussed out here about two weeks ago, I believe, just to refresh your memory, I guess, as to what EPA is recommending for the clean up of the site.

Following Jane's brief recap, we will be taking comments for the record. I have received three cards thus far from people who have indicated that they would like to make comments for the record. And if there is anyone else out there who has not yet given us one and would like to make a comment, please see Kathy James who is out in the front and has the cards. The only purpose of asking you to fill one out is so that we get your name spelled correctly for the record. And, if you have any affiliation, please indicate that also.

I will be calling on these people in the order in which they have filled out the cards. And, if need be, we will limit people to some reasonable time frame to make sure we have enough time for everyone, although presently, it doesn't seem like we are going

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to have a problem in that regard.

Once the formal oral comments have been given, we will close the hearing and that will end the record for the purposes of this hearing tonight. We will be happy to stay around following that to answer any questions you may have, but that will not be transcribed for the record.

If I didn't already say this, we do have someone from Apex Reporting here who will be transcribing the proceedings tonight. That will be available and will be put in the administrative record such that you will be able to read that transcript later.

We are in the middle of a public comment period which ends on September 9th. The purpose of the comment period, again, is for the public to let EPA and the State DEP know what you think of EPA's proposed remedy for the Norwood PCB site, and to comment in general, as I said, on the studies we have conducted.

You have basically two ways to get your views known and to make them part of the record. You can either make oral comments tonight, which again will be part of a recorded transcript, or you send in written comments or you can do both if you like. If you send written comments, we need to have them postmarked no later than September 9th and sent to Jane Downing at the EPA's office. I believe the specific address is listed in the handouts that were given out with the proposed plan and I believe are still available at the back of the room.

If you didn't happen to get that address or are unsure, after the meeting please see us. We want to make sure that anyone who has anything to say gets their comments in for the record. So, again, if anything I have said is confusing or you don't understand exactly what you need to do, come and see us after the hearing and we will make sure you have the correct address and the correct time frame by which to make your statements.

We do also hope that you will submit comments or make those comments tonight. We have had a number of public hearings recently on proposed remedies and have not had a whole lot in the way of public comment and this puts us at somewhat of a disadvantage. One of the criteria we have in making a decision on this or any other superfund site is the acceptance by the general public of the proposed remedy.

And so it's very important that we do find out whether or not you support the remedy, which we hope you would, but if you don't, we would like to know why you don't, what other remedy you think would be better. And, again, it's important that you do get those comments to us.

So, with that, let me just again give you the format. Jane will be recapping the elements of the proposed plan after which we will open the hearing to formal comments. I will again take the people in the order in which they have submitted cards, and at the end of which we will close the hearing.

Following that-- Again, we are not here tonight really to answer questions on the plan, but specifically to take your comments. You may still have questions, and, again, once we close the hearing record, we will be glad to stay around for a while and try to answer those for you so that, you know, you could submit formal written comments later.

So, with that, I would like to turn it over to Jane Downing.

MS. DOWNING: Good evening.

Before I begin the formal presentation, I would like to make a small announcement. If you have your proposed plans in front of you, could you turn to page 8. Essentially, we are making two small changes to the proposed plan. The first one was a typographical error and that is on page 7. Under the

Soil Cleanup Goals, number 2, where it says All Other Soils, at the very bottom of the page we have a chemical which is called 1,4-dichlorobenzene with a number next to it of 260ppm. Unfortunately, that m should be a b. So the soil target level for that particular chemical should be 260 parts per billion, with a b there.

And the next one is at the very next page, page 8, under the Grant Gear Machinery and Office Equipment Surfaces Cleanup Goal. The proposed cleanup goal is now 5 and not 10. We did write a memo which is in the administrative record which explains why that was changed. So, again, we are going with a proposed cleanup goal for the office equipment of 5 micrograms per 100 square centimeters. It's on page 8. Does anyone have any questions about that?

[No response]

MS. DOWNING: I would like to begin with just a very quick summary of the results of the remedial investigation, simply because we are concerned with what chemicals showed up at the site and at what concentration. This is in summary form because we went into quite detailed two weeks ago and also in June.

For this particular site, it is called the Norwood PCB site, so obviously PCBs were the major contaminant and it did show up in the site soils. For the soils within the 26 acre site and most of the Grant Gear Facility. The major contaminants were PCBs. We also had contaminants which we call PAHs. PAH stands for poly aromatic hydrocarbons. The third contaminant class of chemicals that we found are the VOC. The VOC stands for the volatile organic compounds.

So essentially for the soils there are three different classes of chemicals that showed up: the PCBs, the PAHs and the VOCs. You will see, when you read the proposed plan, because they are contaminants of concern, we do target these chemicals so that the cleanup will remediate these chemicals down to an acceptable level.

For the sediments, what we believe happened is that the soils erroded from the site and ended up in the brook. Therefore, the PCBs were in the soils and the PCBs also showed up in the sediments of Meadow Brook.

The groundwater underneath the site, we also found contaminants. These contaminants were mostly the volatile organic compounds. The PCBs really did not show up to any great extent in the groundwater. And one of the reasons for that is PCBs tend to absorb to soils. They don't very easily dissolve.

So those chemicals really we found basically in the soils and the sediments, not so much in the groundwater. Unfortunately, the volatile organic compounds do easily dissolve and we did find them in the groundwater. We will be targeting them in groundwater.

Grant Gear has a drainage system, because of past disposal practices, there are sediments in the drainage system that are very highly contaminated. They are contaminated with, again, the PCBs, the PAHs, there are some metals that showed up in the sediments. So, the drainage system of Grant Gear is also contaminated.

We have, as far as potential health risks, we do have some risks associated with exposure to these chemicals. Some of the ways that you can be exposed to the chemicals is simply direct contact with contaminated soils, direct contact with contaminated sediments. So, we do have a public health risk. They are not too significant other than some of the maximum concentrations. But it is a potential public health risk.

There's also an environmental risk that we also look at because a remedy must be protective of public health and the environment. And basically we were concerned with the environment when we took a look at the sediments. So, we had to set a level in the sediments that was also protective of the environment.

Very quickly just showing this map, because again, for the PCBs it's really the soils that we are mostly concerned about. And the one thing to remember here and this, I think, pretty well illustrates is that most of the soils that we found that were contaminated with the PCBs did show up within the Grant Gear property. The Grant Gear property is approximately nine acres of the twenty six acres.

You can see from the colors that the more highly contaminated soils and, actually, the greatest volume of soils showed up within the property. We did have some high levels that we found in the south bank of Meadow Brook. On the north bank, the levels were fairly low. So, essentially, our PCB contaminated soil was confined to the Grant Gear property with some outlying areas and also the south bank.

Now what I would like to do is just to recap the preferred alternative. Two weeks ago we gave you the preferred alternative explained and then we took a look at some of the other options. Those other options are explained in the proposed plan. They are also explained in the feasibility study and if you would like, we can discuss it after the formal public hearing.

But this essentially is what EPA is proposing for the cleanup of this particular site. There are nine components to this preferred alternative.

The first one is called the site preparation. That is essentially self explantory. We need to prepare the site for the future work. That may consist of grading the site and worrying about collecting the erosion, some erosions, some runoff containment.

The soil treatment, there is quite a significant volume of soils that must be treated. I believe we are talking about 29,000 cubic yards of contaminated soil. We are proposing to treat the soil. The other option would be something like containment.

We are proposing to excavate the soil, anything above the target level, and treat it by a treatment called solvent extraction. That is a chemical type of treatment where you chemically remove the contaminants. The other option that we looked at two weeks ago was incineration. But we are proposing the solvent extraction. It is an innovative treatment. We will have to do some treatability studies.

The sediment treatment will be essentially the same as the soil treatment. We are going with the on-site solvent extraction chemical removal of the contaminants. There's going to be about 3,000 cubic yards of sediments that will have to be dredged from Meadow Brook.

As we talked about two weeks ago, most of the contamination of the sediments started directly near the Grant Gear out-fall. So we are in Meadow Brook at the Grant Gear out-fall and extending all the way down towards the Neponset River. Although the levels between Dean Street and the Neponset River were fairly low, we are still proposing to excavate those sediments.

The next media that we are going to take a look at would be the Grant Gear building. Obviously we need to remediate the building. There is a continuing discharge of contaminants. If we clean up the stream, we really need to remediate the drainage system so that will not happen.

What we are proposing for the drainage system is a two part combination plan. We are going to flush out as much of the contaminants as we possibly can. It's very difficult at this point in time to know whether that's going to work [illegible]% or 100%. We don't feel that we can, through flushing, totally clean out the drainage system. We still believe there will be some manholes or some pipes that will still contain residual contamination.

For those particular parts of the drainage system, we are proposing a containment. They will be filled with concrete. And to whatever extent is needed, we will have to replace those portions of the drainage system.

So, it's going to be a flushing to get out as much of the contaminants as we possibly can, coupled with a containment of those portions that can not be physically cleaned up.

We are also worried about the possibility that the roof of Grant Gear is contaminated. And even though those levels are fairly low, the values that are allowed to go out to the stream are incredibly low. So, the roof may have to be remediated. We are going to do some additional sampling to figure out to what extent that will be.

If that is true, we are proposing to clean up the roof. There are stones out there presently, and if need be, seal the roof. The other option for the roof could be something like a removal of the roof.

We did take a look at the machinery inside the building because of the past history. There were some low levels of PCBs that were found on the equipment. They were fairly low. They were very close to our PCB number that is in a TSCA regulation. However, we are still proposing to remediate that down to a certain risk level. We are concerned about the future, every day exposure to those low levels.

So, we are proposing a remediation of those and that would be simply decontamination. We will be taking a solvent and essentially washing the equipment to remove the PCBs.

Groundwater needs to be collected before you can treat it. There will be two parts of a groundwater collection scheme. One will be a trench located along the northern border of Grant Gear, close to the fence between Grant Gear and Meadow Brook. That would be to collect some of the top groundwater, some of the overburdened groundwater and some of the shallow bedrock. That is essentially where most of the contamination lies, in the overburden and also the shallow bedrock.

To whatever extent is necessary, we may have to put in some very deep wells to get some of the deep bedrock groundwater out.

So, we are proposing a trench for the overburden and shallow bedrock and some extraction wells for the deep bedrock.

The groundwater will have to be treated. We are going with a fairly readily available treatment, it's been used at a lot of sites, called air stripping. It essentially strips out those VOC compounds.

We also may have to remove some metals simply because you are only allowed small levels of metal going into the brook. And that will have to be removed by, again, a fairly common treatment, which is called precipitation and filtration. You add some chemicals and it precipitates out the metals.

For the PCBs, again the PCBs tend not to be dissolved in the ground water, but they tend to be absorbed to small particles and we are proposing to remove that by carbon absorption. It's a filtering type of treatment.

The wetlands was a special issue that we talked about two weeks ago. Part of the guidelines, part of the laws of the land, we need to inform you that there will be some wetlands impact. The area between Grant Gear and Meadow Brook has been designated as a wetlands, although you go out and see a forest there, it is a wetlands.

Therefore, if we want to go after the sediments, we will have to possibly take down some trees. So there's going to be a lot of impact to those wetlands areas. We feel that there's really no other choice. If we are going to clean it up, we are going to have to impact them.

But, under the law, what we need to do is, to the extent possible, go back and restore that area. That will be somewhat difficult because you have trees there, but that is the proposal to do a wetlands restoration program for those areas impacted.

There will be long term environmental monitoring. We are not proposing to go after the soils underneath the water table. So, there will be some soils that will remain on the site, as well as whatever contaminants are remaining in the drainage system. And because of that, we are going to be doing some long term environmental monitoring. We will just be checking on it periodically making sure that there isn't any release, making sure that we are being protective of human health and the environment.

And finally, we are proposing institutional controls. We talked about this before, but basically we feel that there is a need to make some restrictions on the use of groundwater, especially within the Grant

Gear facility.

Because of the possibility that little PCB particles could end up in the groundwater, we don't feel comfortable saying that you can drink the groundwater at Grant Gear, even though we are cleaning up for the other chemicals. Because of that small possibility, we are going to have to impose some institutional controls so that wells are not drilled in that area.

The other reason why we need them is because, if the drainage system is going to remain there, we need to put some kind of deed restrictions for any possible future owners to let them know that they can not fool around with the drainage system and cause a release.

And I just have two more transparencies, just a very quick review of what we look at before we pick a decision. We have a, I believe it's nine criteria that we use to evaluate all the alternatives.

The first one is probably the most important, it's the overall protection of human health and the environment.

The second one is more the technical nature of the project, is it going to be effective in the short term, is it going to be effective in the long term.

We then want to look at whether the alternative will reduce toxicity, mobility and volume of contaminants. We prefer a treatment as opposed to a containment because containment will not reduce toxicity.

We are also looking at whether the treatment can be fairly implemented. Is it a readily available treatment? And we feel that the ones that we have picked are.

Cost, of course, is an important factor and we do look at cost. We need to figure out whether our decision is a cost effective decision and, obviously, we feel that is true.

And there are a lot of laws, including the wetlands law that we also have to look at. We have to make sure that we are complying with, basically, state and federal laws.

The state needs to tell us how they feel about it. There's a state acceptance that is part of the criteria.

And last, but not least, is the community acceptance. How does the community feel about the proposed plan? Are there some aspects of it that they are concerned about? Are there some other alternatives that they would choose. And that is essentially why we are here tonight.

I would like to close just with a quick schedule outline. The first two we have actually finished. We are at the -- during the public comment period and you need to know that that will be up September 9th. And the ROD is proposed to be signed at the end of September, around September 30.

Thank you.

MR. CAVAGNERO: Thank you, Jane.

Before we take comments, I just want to make one further point. Jane indicated we will be signing something called a ROD in the latter part of September. This is short for Record of Decision, which is the Regional Administrator of EPA's decision as to what the remedy will be on this site. Again, to date, we have only proposed the remedy, we are now in the process of accepting public comment and we will be going back, following that comment period, and coming up with the final remedy.

Once that Record of Decision is signed, it will also include a section called a responsiveness summary and this essentially will be a summary of all the comments we received from all parties, either at tonight's hearing or in writing, and it will include our responses to all those comments. So, you will, when the Record of Decision, also know how EPA addressed any comments that you did raise during the public comment period.

With that, I would like to open it up. In order to get on the record, you will have to approach the mic.

The first person is named Robert Clement.

MR. CLEMENT: First of all, you said that the 1983 record, it was very recently that we (unintelligible) we were told that if documentations from DEQE, EPA, that at the end of 1983-84, this was all cleaned up, we had no other problem. Six months later, you came back and you said you left a little bit of contamination around Grant Gear. It's all documented, all in files right there and I have more at home.

Then Mr. Hourihan and few -- you will have to excuse me, all you people are new to me, you know, I'm used to looking at the old faces, Mr. Hourihan and Fitzgerald and a few other people. The only one I recognize here tonight is John.

Anyhow, we were told that this place wasn't going to be touched for ten years because it had to go into a certain classification of land that they watch after all this was done. Ten months later, we get an industrial park in Kerry Place. And you tell them the place is so clean, you guaranteed the water was so clean that you could build an industrial park there. Now I see that on the map here that you have 10 to 100 parts per million PCBs still on the spot where you had been writing as clean.

And in your latest survey that I have over here, you are telling the people who worked there and who had done the construction that they may be in danger of contamination of PCBs.

Now, I understand from your office about water and groundwater. You seem to go back and forth where you say we are going to clean this up to a point, we are going to clean that up to a point. There may be some of this left over here. We are only going to bother with so much of this in this spot.

As far as concrete goes, do PCBs pass through concrete, does anyone know?

MR. CAVAGNERO: Pass through concrete?

MR. CLEMENT: Yeah.

MR. CAVAGNERO: It can penetrate concrete.

MR. CLEMENT: It can penetrate concrete, then how do you plan to seal a drainage system with concrete?

MR. CAVAGNERO: Well, we would be happy to-- Basically, sealing the drainage system means you are keeping water -- I mean, you can make a fairly good seal to keep water from passing through it.

MR. CLEMENT: Water will go through concrete. Water leaks through concrete.

MR. CAVAGNERO: Well, I guess we are looking at what rate.

MR. CLEMENT: I would like to bring up the fact -- I raised my family there, we have a lot of people who are concerned there and you won't see a lot of the neighbors here tonight because, frankly, we are kind of tired of the EPA and DEQE. No offense, but we have had an awful lot of it.

Bear in mind, you people in June are the ones that came up to us and told us to throw our shoes away. Then you said everything's all clean. Then we have an industrial park here and now you are telling us it's dirty again. Then you tell us the groundwater is never going to be cleaned up completely, that you can't ever be able to drink the water.

That might not be a big deal, but prior to that, no one had clean water there. Now you have certain parties go out and dirtied it. I'm sure you are liable to the Town of Norwood for that.

How about the people in my neighborhood who for years have had gardens in their yards. Are these safe?

Can any of these questions be answered? Before or after you cleaned the water in the land?

MS. DOWNING: I think at this point, the best thing to do is to tell us what your comments are on what we proposed.

MR. CLEMENT: You've got to tell us what you are going to do. What we-- You can say you want to know how the Norwood-- You just stood here a minute ago and said, How do people in Norwood feel about this; right?

MS. DOWNING. Right.

MR. CLEMENT: Can I grow tomatoes in my yard? These are things that the people in Norwood want to know.

When you come up with this program, when you did your foundation work, you drew test walls all over the place. Were you well aware that since the early '60s that Norwood has had a severe problem with the drainage system and the sewage systems and leaking in the MDC water system in that neighborhood?

I have it all documented here. I have orders from your office, DEQE, Attorney General to have all these things fixed. These go back as far as the '60s. There's never been enough money to fix all this stuff.

You have groundwater with VOCs in it and PCBs. It is groundwater; right? It's carrying water back and forth. It's also wetlands. My own backyard, I have pictures of the groundwater flooding. So, all this stuff is getting all mixed up through the sewer system to the drainage system.

And what I want to know, too, is ever the potable water in this area ever going to be tested to see if there's ever been any mixture of that during a wet season. I'm sure it hasn't during a dry season, but during a wet season, are we drinking this stuff?

There's been a lot of emphasis on Grant Gear. Grant Gear, I know, is an innocent company as far as PCB goes, but as far as VOCs, that stuff is used to clean up machinery. What your map doesn't show is that an inside drainage system that goes directly to the brook. It's in your older maps, I have it over here, I found it. And all this stuff is their mess. You talked about the VOCs that are down in the dirt, who says it isn't their mess?

PCBs was there for 40 years, starting off with the U.S. government was there, Toby Buchman, Cornell Dublier, all the rest of them, have it all over here, gave it to you in 1983. Now, six years later, you really haven't come too far.

And you want to know why people in Norwood are a little bit upset? This is why. We think it's going to take you another twenty years just to draw another map before you do anything.

We also want this cleaned up, as the Town Manager will tell you. We have been waiting for years for a new sewer system. We can't get it until you people clean this up. And this is not something that's been in the back of our minds, this is something that floods our cellars during wet seasons. This is something that's very important to us.

This just added to our problems. We see this through the ground. It mixes. We don't know if it's in our drinking water. We don't know if we can eat food from gardens. We don't know if the kids can walk barefoot in the grass because the groundwater does come up all over the place. I have pictures of my backyard flooding. I have pictures of the sewer system being suspended two feet out of the ground by water pouring out of the sewer systems.

This is all past history as everyone here knows. We are not so interested in whether you are going to tear Grant Gear or relocate them or plug it up. We want to see-- Anything that's dirty, we want to see out of there. And we want to know whether or not the water is any good or not.

I can talk to you after the meeting about twenty other questions. I don't want to take up the time because it really doesn't have anything to do with the regional project.

This project that you are talking about should include these questions, should be addressing these problems. You stood here and said, you wanted to know what the people in Norwood think, how they feel, what they are worried about. We lived on it. We have kids that grew up there, played in it, physical contact, rolled around as kids.

And the super hot spots were in Kerry Place. They were even hotter than the ones we have at Grant Gear. And this has all been leached over a period of more than forty years, almost fifty now, because it's come six years to get to this point. So you are talking just four years shy of fifty years of leaching.f

We want to know how dirty the soil is and the water that we live in.

Thank you.

MR. CAVAGNERO: Thank you.

You raised a lot of questions there. We will respond to those, as I said, in the responsive summary, but I would just like to make a couple comments.

As part of this Record of Decision, we also consult with a group from Atlanta called the Agency for Toxic Substances and Disease Registry, which is an arm of the U.S. Public Health Service, and also on the state level with the Department of Public Health. They will be doing what's called a health assessment.

I'm not sure exactly what status that's in, but that will be included in the administrative record, with the Record of Decision. That will be basically the viewpoint of these people who are essentially public health professionals as to, you know, their own professional viewpoints as to what are these risks you talked about.

You have raised a lot of legitimate ones and we will respond to that in the Record of Decision. I think our opinion thus far is that the removal action that was done. I won't tell you what those people said to you, I wasn't there. I won't dispute what you said.

I guess our view is that they tried to do that under what are called the Emergency removal authorities we have and I think they felt that they took care of the bulk of the worst contamination which was presenting any kind of immediate threat and left only what they thought was essentially more of a long term threat that could be addressed after more detailed study and evaluation.

And we are of the opinion at EPA, and I believe the State agrees, that we do not see that the current situation presents an immediate risk and that if it did, we would have done something about it.

But, again, all of the questions you raised are perfectly legitimate and we will respond to those in the responsive summary with the ROD.

I thank you for your comments.

Next is Mr. John Carroll.

MR. CARROLL: Good evening.

My name is John Carroll and I'm the Town Manager of Norwood.

I would like to ask a couple of questions about some items on page 10 and 14 of the report, and then some comments and questions about the -- some of the paragraphs on page 11.

On page 10, where you are talking about the disposal of soils, especially the dredge piles, do we assume that what you are saying there is that the dredge pile is essentially going to be removed from the banks of the brook and then cleaned and disposed of in some fashion throughout the site? Is that what I understand is going to happen. The answer is affirmative there.

On page 14, there was some reference there to operation maintenance costs having to do with groundwater and the soil remover. What-- I don't understand what that is about. Does that mean that there's going to be some ongoing maintenance and operation on the site for a period of time? There's a substantial amount of money there, 2 million dollars, I think, or [illegible] million and a half dollars for both of them.

MS. DOWNING: It's basically the O&M of doing the soil treatment, bringing the treatment to the site and maintaining the treatment system.

MR. CARROLL: Maintaining the?

MS. DOWNING: The treatment, the actually doing the work of the treatment.

MR. CARROLL: But once you leave there, there will not be continued operation and maintenance, will there?

MS. DOWNING: Once it's cleaned up, it's cleaned up. So, the O&M basically stops for the soil and sediment. There will be monitoring done, but that will be for some of the drainage system soils around the drainage system and the groundwater.

The proposal is that it's going to take about two years to do the actual soil and sediment part. Once we do that work, that should be it for you.

MR. CARROLL: The main questions and comments I have have to do with the Brook.

I know that both EPA and DEQE are aware of the fact that the Town of Norwood has -- on the books, it had advanced to the design stage a project to dredge and deepen Meadow Brook from Pleasant Street right down to the Neponset River. And as part of that, that these plans were done through with the help of DEQE's -- DEM's with their funds.

We ended up having a plan which was acceptable to DEM that showed a particular cross section, a particular depth, a particular profile. Can we get some agreement that the work they are going to do is not going to have to be redone by the Town of Norwood or some other entity at a future time if you are excavating 3,000 cubic yards of material? Can we get some agreement that that material is going to be excavated to the profile that we had anticipated our dredging to be done and to the cross section as well?

Is the answer affirmative to that?

MS. DOWNING: I think we have to take that under advisement.

MR. CARROLL: Well, should we-- Let me ask a question. Do you have in your possession a copy of those plans?

MS. DOWNING: Yes.

MR. CARROLL: You do; okay.

How will we know what you are going to do? I mean, I don't want to receive that last thing, you call it the ROD, or whatever you call it, that says we have listened to Mr. Carroll and we decided that we are not going to do it. How do we get some input in this thing, because we are talking about a large financial commitment here.

If you are going to go in there and clean the brook, you are not going to clean it with teaspoons, you are going to clean it with a backhoe, I would guess, which means, as you indicated before, that trees are going to have to be removed.

If you are going to put a pipe in that's going to parallel the brook for some length, I would assume that that's going to be a pipe of some major size because that brook carries a lot of water. I don't think of how many cubic feet a minute it carries, but it's up in the area of 1,000 cubic feet a minute or something like that.

So that, you are going to do some major construction work on that brook, and what I'm trying to get at is that I don't want to see this work done by you and the effort essentially be wasted so the Town of Norwood has to come back and spend a half a million or $750,000 later on.

If you are essentially going to do it, I would like to make sure that we have a cooperative effort. Maybe we have to put some money in to be part of it, but what I want to do is I just don't want to see work done twice. How do we assure that that can take place? Can we arrange for a meeting with you or something, Jane?

MS. DOWNING: I think we can have a meeting to clarify what the concerns are, but I believe at this point is that I know what you are saying.

I'm not really sure what I can say as far as an answer, what we can do under Superfund. There are some legal constraints to what we can and what we can't do. And I think we will basically have to take it under advisement and we will talk to you about it.

MR. CARROLL: Okay.

MR. MC ALLISTER: Let me just say something that, you know, there's a lot of stuff that you are talking about is going to have to be really flushed out in design work when you are actually looking at it.

Just to continue on with what Jane was saying, what we feel we can be authorized to spend out of the Superfund and select a remedy is what is necessary to remediate the risk that's there. I think that we have made it clear that we expect to excavate more soil than would be done in order to meet your flood control project.

If that doesn't necessarily follow the specifications, that's something that is going to because we are following the contamination rather than the specifications. And I think that the kinds of discussions you are talking about are ones that will take a good amount of working out arrangements if you want to try to coordinate. And I just don't know if that's the kind of thing that you could really usefully resolve at this point.

MR. CARROLL: I know we can't resolve it at this point, but I would like some sort of a commitment to work together to try to achieve a mutually beneficial goal which is not only the cleanup of the

PCBs, but also the dredging and the increasing of the capacity of that brook.

And also, we are not asking you to spend any more money than you are allowed under Superfund. We are saying that if you are going to excavate more than the soil we are going to take out, we would like you to work to our cross section.

Obviously, we would not -- say you go down the brook and dig it out a half a foot too high and have the cross section off and have us go back and do it over again, it makes no sense. I mean, it's going to be an inconvenience to the neighbors to have machinery and so forth go back in there again at some future time. We want to be sure that the cross section is correct and the depth is correct.

Now, I think that that is not an unachievable goal for both of us if we work together on it.

MR. CAVAGNERO: I will only make one comment on that, Mr. Carroll. The 'us' in terms of who does the remedy may not be the EPA or DEP. Our statute that we work under basically is written such that Congress wants EPA to get the responsible parties to actually implement this and any other ROD. As a matter of fact, the language is really quite clear that we are really not supposed to go and tap the Superfund money until we make an affirmative determination that there are no responsible and able parties out there who were able and willing to actually do the remedy.

So what I'm saying is, hopefully after we get this record of decision, we will actually get a settlement with responsible parties to do this work, but we will certainly, in negotiating that settlement with them or in doing the work ourselves if we can't reach a settlement, you know, consider what we already know to be the Town's desire to have their flood control project to go forward post haste or as soon as we can do things given our limitations.

MR. CARROLL: I can understand that but I -- what I'm trying to say is that, for instance, if there's a cross section of the brook in the shape of a, let's say, a flat U and you are going to go in there and excavate only the PCBs out of the bottom of the brook, obviously, as soon as you left there, we begin having washouts in the embankments of those brooks.

So, I would assume that you are going to leave the brook essentially whole. I mean, you are going to slope it in such a way that washouts don't occur from the banks of the brook. That would be inappropriate and reprehensible, as far as I'm concerned, for anyone to come in there and excavate the brook in such a way that the slopes are going to fall in.

MR. CAVAGNERO: We wouldn't be able to do that under our law anyway. We have to follow basically the executive order on wetlands which includes streams, which requires us, when we do work with wetlands, to mitigate any impacts we are causing by our excavation. We would not be able to leave a situation you are describing.

MR. CARROLL: I think our goals are compatible because we are basically, we only planned to excavate the brook a foot or so anyway, in depth, a foot and a half, and we plan to do something with the slopes to keep them from caving in; that's basically what we are trying to do.

MR. CAVAGNERO: Right.

MR. CARROLL: So I don't think there's any great deviation between what you are trying to do and what we are trying to do, except for the fact that we would be redefining or reshaping the brook from Pleasant Street down to Grant Gear and you are not doing that--

MR. CAVAGNERO: We are not talking about the same portion that you are.

MR. CARROLL: Yes, but you are talking about the major portion of the brook that we are going to do which is from Grant Gear down to Neponset Street; that's the longer length. We would certainly like to work that out.

I will not keep on talking, but I would certainly like to meet with you, Jane, at some early time to work out some sort of details and get some sort of a commitment on this.

Thank you.

MR. CAVAGNERO: Thank you.

Next is Theresa Luna.

MS. LUNA: My name is Theresa Luna. I live at 36 Audubon Road, Norwood.

There's just a couple questions I have in regards to the preferred site objectives.

One is that I would like to know the length of time of the cleanup. And, when you opt for the flushing out of the PCBs versus on-site incineration, what is the time frame in the cleanup? Is it quicker with incineration versus flushing.

And also another question is, I feel that if you flush out the PCBs in that area, the water table is incredibly high. What is the chance of contaminating the abutting residential areas?

Also, in the abutting areas, will wells be allowed to be drilled in the area, or is that area forever not to be have any on-site wells drilled at all?

Also, I would like to know how you inform residents in the area about the contamination, especially new residents that enter the area that know nothing about it who are buying homes in the area?

I'm infuriated at the fact that this was found in 1984. I bought a house in July of 1985 and I had no information about this contamination until October of 1987. I would like to know why there's been such reticence in giving out this information? Why, until 1988, a map was finally published in the paper in regards to the area that was abutting the Grant Gear site?

Also, on the capped area, will cars still be allowed to be parked on the area of contamination, where the cap is coming apart in spots?

I guess I'm very angry. I don't agree with the soil and sediment contaminations that are going to be -- the preferred manner of dispensing with it. I would prefer on-site incineration.

And I just want the area cleaned up. I think it's been dabbled with enough. I just want it out of there.

Thank you.

MR. CAVAGNERO: Thank you.

Next we have Stanley Wasil.

MR. WASIL: Some of these things Mr. Carroll asked, but my problem is this -- I'm a Town Meeting member, I might as well mention that. I represent that whole area down there and I'm also a resident that lives right behind this PCBs and right next to the Meadow Brook.

One of my problems that I'm really concerned about is with the time schedule. I've heard in the newspaper, I haven't seen it in this, of seven years to correct or to do the work on the Meadow Brook. That seems like an excessive time.

MS. DOWNING: Seven years to clean up the groundwater.

MR. WASIL: This is where I come to loggerheads on. I don't like this.

Many of the people in the Meadow Brook area have storm drainage backups in their cellars and out in the streets and the kids are playing out in the streets with this stuff coming out of there. And in many cases it could be PCBs. We have chemicals in that brook. And this happens when the brook gets high, when the water comes down from a rainstorm, the water backs up because it can't go down the brook because the brook is too narrow.

We have another problem there. In fact, we have several problems there. We have a pipe that goes across the brook and the water can't go over it if it's -- if the brook is brought down. So, Mr. Carroll's come up with another method of getting the water down the river. But we do have a problem down there with Route 1 down there. It's not the-- The drainage area is too narrow and it just keeps on going.

We want to get started on this project and Mr. Carroll has come up with a plan to do this. And, because of EPA's slow action, this has been going on over two years, I know, trying to get this work done, this Meadow Brook excavation project as of right now is at a standstill. And it looks like it might be at a standstill for another seven years.

I would like to see this done first. I don't see any reason why this can't be done first, the brook excavated because all you need is trucks to bring the stuff away and then we can start digging this thing up.

You did mention that there was going to be a flood plane disruption which could cause added problems to the residents. We do have a problem there -- it's well documented -- we have had helicopters come in from the various newspapers and the radio and TV stations taking pictures. It's on record and it's also on record at the Board of Health. They have all kinds of pictures of the flooding that goes on there.

So, I would advise you to take some kind of precaution or come up with a plan that if we start getting flooded, you know, the PCBs are bad, but being flooded out of your house is very bad, too and we don't want this to happen.

So, I'm bringing these two areas up for your consideration.

I have another one and I don't know how to address this one but this is a very serious problem. We are cleaning up, but we have some companies that are adding to our problems right now.

Most of us have read about Northrop. They got them for dumping. And there's a brook that runs right behind them. Then you have Savagran who works on all kinds of chemicals and they also connect up to this Meadow Brook. Then we got this foundry that's located right next to Savagran. They also work with the same chemicals that were found in that brook. And they couldn't believe it when they were going at the PCBs the level of chemicals when this first came up.

So, I'm asking you, I don't know how we can fit this in, I know you are working on PCBs, but if we are resolving the PCBs, we shouldn't be letting other chemicals come into the brook. And these are three companies that work with this stuff that's in that brook. I would like to get it cleaned up.

That's all I have to say.

MR. CAVAGNERO: Next we have Arthur Rico.

MR. RICO: Yes. I live on Audobon Road.

I would like to make on comment. I'm against the chemical treatment as such. We have enough chemicals in that area now and we have enough chemicals being dumped into the brook. Also it seems that it's a cost factor that the chemical treatment was chosen because of the cost factor, and that the actual, in your statements, stated that the incineration method was a more proven method, although it's a little more costly.

I think that with the chemicals in that area and the environment and so forth, I would rather see incineration used.

Thank you.

MR. CAVAGNERO: Now we have Joseph M. Welch, Superintendent of the Department of Public

Works.

MR. WELCH: My name is Joe Welch and I'm the Superintendent of the Public Works here in Norwood.

I have to go along with a lot of things that John Carroll said previously. But, we have been trying to clean Meadow Brook for quite a few years and take care of the channelization of the whole brook.

Now, with the problem that we have now down at the Grant Gear area, I hope that we can work together and solve a lot of the problems.

We have a drainage problem in the center of town that relates to the brook.

And some of these programs that we have started have been held back a little bit because of some of the regulation of the EPA and the DEQE. We would like to clear up the problems with the brook, the problems in the Grant Gear area and work together with you to solve the problems for the whole town, not just the one area.

So, I hope you can work with us and do the whole project and not just the one major problem we have. We would like to channelize the whole brook area and clear up the PCB problem, too.

Thank you.

MR. CAVAGNERO: Is there anyone else who hasn't made a statement who would like to?

Could we just get your name and the correct spelling for the record, please?

MR. EVERS: Yes.

My name is Robert Evers, E-V-E-R-S. I'm a resident of Hillside Avenue at the corner of Pellana Road.

I have been very remiss in not attending the recent meetings and actually came late tonight, but I do have some serious concerns as a resident of the area.

It seems to me that about a year and a half ago there were test wells dug at the corner of Hillside and Pellana. They were dug -- the crew was out there at 7:30 Sunday morning one weekend. I called Jane Downing at that point and complained about the men working on Sunday morning at 7:30. But, no results of that ever came forth. And I'm just not sure, what were the findings outside the Kerry Place area? Can anyone address that?

I have a number of questions, that's number one.

MS. DOWNING: We can certainly go into all that detail even after the formal comment period. But

I can tell you very quickly that those wells turned up clean.

MR. EVERS: They turned up clean.

It's my understanding that, earlier tonight, although in this description in the proposal, you people maintain that there is no contamination in the groundwater off of Grant Gear that somehow or other it came out tonight that it turned out that maybe there could be?

MS. DOWNING: No.

Should we wait until after the comments are finished?

MR. CAVAGNERO: No, go ahead.

MS. DOWNING: The groundwater wells that we sampled outside the Grant Gear boundaries all turned up clean, and that includes wells across from Meadow Brook. So, the only contaminated wells that we found were within the Grant Gear boundaries.

MR. EVERS: Have you sampled resident's wells in the area that might have groundwater wells?

MS. DOWNING: No, we haven't. In fact, if you know of any residential wells in the area, we would like to know about them.

MR. EVERS: I have a neighbor that has a groundwater well. He uses it only for sprinkling his lawn, but if this chemical is there, then I think that his and all wells in that area should be tested.

I don't think my coming up with the names is important, I think you have to--

MS. DOWNING: Well, we can explain exactly where the contamination started. And we think we have defined exactly where it is and we do not feel that it's outside the Grant Gear boundaries.

I will show you the maps and where it's going so you can see exactly where we think it is.

MR. EVERS: Thank you, I would appreciate that.

I'm curious that the source of the DOCs and the [illegible] and all the other letters that are coming out, that there's a source that's identifiable, you know, you don't have to name names, but have you found a source for that? Is that also industrial in nature?

MS. DOWNING: We haven't specifically mentioned what company was fairly responsible for what chemicals. We feel that with industries and industries normally use all kinds of chemicals, they use degreasers, and as part of degreasers, you can get some of the chemicals that we found.

So, we don't know specifically what company is responsible for what particular chemical, but we feel that the nature of the businesses that were there in the past, most of them could have contributed to the VOCs that we found.

MR. MC ALLISTER: Jane, maybe he's asking, though, if we know what the source of the contamination of the groundwater site. I mean, I think that we have identified the source of where the contamination is, has been coming from.

MS. DOWNING: Right.

As far as the area, we feel that the source of where the groundwater contamination is coming from is basically in the back of Grant Gear. So that area right in the back of Grant Gear is where most of the groundwater contamination turned up, highly contaminated groundwater compounds. From there, we have traveled, the way the flow was going the values decrease.

So, just by looking at where the chemicals are turning up, we feel that the source area is in the back of the building.

MR. EVERS: Being a layperson and not aware of the EPA standards that they set for superfund monitors and so on, it seems to me, just reading this, that it's somewhat hypocritical in the sense that, Oh, well, we are going to do this. We are going to excavate 30,000 cubic yards of soil, we are going to excavate 3,000 cubic yards of sediment from the brook, but we are going to bury a lot of other things. You are just going to let it sit there.

We are going to leave the pavement. We are only going to dig it up if it's really in excess of the highest of standards. I mean, we are not going to go into Grant Gear and find out what's underneath Grant Gear. We are going to put something over their roof. We are going to sort of entomb a pipe in the ground.

It seems to me that this is a very hypocritical approach to hazardous waste. I know you have to take into consideration and, you know, all apologies to the owner and the people at Grant Gear, but I see this as hypocritical and that somehow or other the remnants of what's left there, whether you entomb things, it's just going to come back again years down the road or even months down the road, you know, depending on, you know, the nature of weather in this area; whether or not we are going to have a high water table or earthquakes or hurricanes or whatever.

If we entomb things, it doesn't make any sense to me to spend all this money and then say, well, down the road, these problems can all come back and haunt you again. Why aren't we approaching this thing as a buyout of the Grant Gear and clean that property up.

MR. CAVAGNERO: We will address that in the ROD and we will respond to that comment.

MR. EVERS: Finally, I would like to echo my sentiment with respect to introducing further chemicals to the area in the clean up process, better left undone than to bring more chemicals in there in the process.

MR. CAVAGNERO: I would just like to clarify that before anybody leaves tonight. The process we are talking about is basically washing the soils. In other words, using something akin to a detergent to get the toxic pollutants out of the soils. The fact that we are using chemicals to do it doesn't mean that we are then going to leave all these chemicals behind.

MR. EVERS: It seems to be my experience that the EPA and medicine finds additional carcinogens every day of the week. It seems like you can't turn on the TV and say, Well, you can't eat this and you can't do that. So, I'm going to reiterate, introducing any chemicals, any further chemicals to that area is completely against my wishes.

Thank you.

MR. CAVAGNERO: Well, if we don't have anyone else, we would like to make an oral statement -- yes, we do. Okay, one more.

Please state your name for the record.

MR. RABBITT: My name is Joseph Rabbitt, R-A-B-B-I-T-T. I live at 93 Audobon Road.

My wife has been coming to these meetings, but she couldn't come tonight.

On page 7 you say that you propose a soil cleanup level of 1 ppm. You guys came up a little over a year ago and tested in my backyard, less than 20 feet from my house, and found levels nearly twice that. Are you going to clean that up for us? Just a simple yes or no.

MS. DOWNING: We anticipate it.

MR. RABBITT. Oh, good. Okay.

The other thing is, we had blood tests done on June 8th, which is like two and a half months ago. We haven't heard anything. Have you guys heard anything?

MS. YOUNG: We are still waiting for the results from the Department of Public Health on that.

MR. RABBITT: Will we know soon?

MS. YOUNG: Yes, we should know within the next month or so. As soon as I get a copy of the report, I will make it available to the public.

MR. RABBITT: That's all I have.

Thank you.

MR. CAVAGNERO: Would anyone else like to make a comment?

(No response)

MR. CAVAGNERO: With that, I would like to thank you all for coming and sharing your comments and concerns with us and again, remind you that you still have until September 9th to submit written comments, whether or not you have made comments tonight and that we will, again, respond to any comments made either at tonights hearing or in writing when we issue the Record of Decision.

Thank you for your attention and for your time.

(The public hearing concluded at 8:45 p.m.)

## CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: RICHARD CAVAGNERO, Chairman

in the Matter of:

PROPOSED CLEANUP PLAN FOR THE
NORWOOD PCB SUPERFUND SITE

Place: Norwood, Massachusetts

Date: August 24, 1989

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above titled proceeding.

| | |
|---|---|
| Martin T. Farley | 8/31/89 |
| Reporter | Date |
| Laura Madi | 8/31/89 |
| Transcriber | Date |

# APPENDIX B
# ADMINISTRATIVE RECORD INDEX
# NORWOOD PCB SUPERFUND SITE

Not included

# APPENDIX C
# STATE CONCURRENCE LETTER
# NORWOOD PCB SUPERFUND SITE

*The Commonwealth of Massachusetts*
*Executive Office of Environmental Affairs*
*Department of Environmental Quality Engineering*
*One Winter Street, Boston 02108*

Daniel S. Greenbaum
Commissioner

September 28, 1989

Paul Keough
Acting Regional Administrator
U.S., E.P.A.
JFK Federal Building
Boston, MA 02203

RE: Norwood PCB Federal Superfund Site
Concurrence with ROD

Dear Mr. Keough:

The Department of Environmental Protection (the Department) has reviewed the preferred remedial action alternative recommended by EPA for the source control and management of migration at the Norwood PCB Federal Superfund site. The Department concurs with the selection of the preferred alternative for the site.

The Department has evaluated EPA's preferred alternative for consistency with M.G.L. Chapter 21E as amended in November, 1986, and the Massachusetts Contingency Plan (MCP). The preferred alternative addresses the total site clean-up and includes the following three components:

(1) excavation, treatment and on-site disposal of soils and sediments
(2) extraction and treatment of groundwater via air stripping
(3) flushing and/or containment of the Grant Gear drainage system; cleaning and sealing of roof surfaces; decontamination of building interior surfaces.

The Department has determined that at this time the preferred alternative can not be considered a permanent solution as defined in M.G.L. CH 21E and the MCP. The preferred remedy does meet the MCP Total Site Risk Limits but does not assure the attainment of these limits during any foreseeable period of time. With the implementation of institutional controls as proposed in the ROD, the preferred remedy can be considered a temporary solution. These institutional controls would be used to prevent exposure to (1) groundwater and (2) contaminated soils and drainage sediments which remain on site. The Department can not consider the remedy permanent until or unless institutional controls are proven effective. Moreover, the Department believes it feasible that new technologies may be developed to attain groundwater to background concentrations.

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VIRONMENTAL PROTECTION

As required by the MCP, a temporary solution must (1) include a plan for developing a permanent solution, (2) include systems to monitor its effectiveness, and (3) remain effective until a permanent solution is implemented. The Department, therefore, anticipates that the effectiveness of the institutional controls provisions as well as the feasibility of new technolgies will be evaluated on a continuing basis.

The proposed remedy appears to meet all ARARs. The Department will continue to evaluate the ARARs as remedial design progresses and during implementation and operation of the remedy.

The Department looks forward to working with you in implementing the preferred alternative. If you have any questions or require additional information, please contact Dale Young, Project Manager, at (617) 292-5785.

Very truly yours,

Daniel S. Greenbaum,
Commissioner

DS/DY/bkt

cc: Anne Bingham, DEP - OGC
Steve Johnson, DEP - NERO
Helen Waldorf, DEP - Boston
Jane Downing, EPA ✓